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Architecture in Birmingham.

NEXT week the National Association for the Advancement of Art is to hold in Birmingham its third annual Congress, and in the course of the proceedings a good deal will be said about architecture, wherein it consists and how the architect should be educated, or not educated but evolved, according to the various views prevalent with various speakers. It is to be hoped that the ground on which this seed is to be sown will not prove as hard and unfruitful in the future as the outer aspect of Birmingham, architecturally considered, might seem to threaten. There is no doubt that up to the present time Birmingham is one of the most architecturally depressing of all our large towns; and that if there is anything to be taught as to the true nature of architectural art from those who will speak on the subject at the Congress, such teaching could hardly be brought anywhere where it is more required. There is something about the architectural barrenness of Birmingham which seems to require some special explanation. The two or three good buildings there, one of them barely completed, are all the work of outsiders; and our own experience, which we give rather in sorrow than in anger, is that we are scarcely ever able to accept for publication in this Journal any architectural drawing sent from Birmingham. There is a peculiar and defiant absence of beauty or refinement in its local architecture which is not so conspicuously noticeable in any other English town that we can call to mind. Mere commonplace and absence of all pretence at architectural design of course is to be found in all quarters; but this is not a complaint special to Birmingham. On the contrary, there seems a great inclination there to be both ambitious in design and costly in execution, but the results are not of the right kind. People used satirically to speak of a certain type of architecture as "Manchester Gothic," but while Manchester has somewhat improved her old reputation in this respect, it is to be feared that Birmingham Gothic must be placed in much the same category.

This phase of Birmingham architecture is of course of comparatively recent birth. The building which marks the architectural centre of Birmingham is Classic of the most pronounced type. It is a little more than half a century since the old and now we fear not much respected Town-hall was erected, a building the offspring of the same Classic creed which produced St. George's Hall in Liverpool. It is far inferior in size as well as in general effect to that structure, being a mere hall, whereas the Liverpool building is a hall and law-courts combined; and what is more important to notice, there is no such attempt in it at any new treatment of Greek features as there is in parts of St. George's Hall. It is frankly and purely a Classic temple with a peripteral Corinthian order, mounted upon an abnormally lofty rusticated podium. The *motif* of the podium was in part, no doubt, a practical one; it was intended to utilise this portion for offices, making a utilitarian story, in fact, below the state story on the upper level. The worst point about it architecturally is that there is no external suggestion of the means of access from the ground story level to that of the hall; but that was the way with the modern Classic building of the temple type. Staircases did not exist in temples, and could not therefore be recognised in modern imitations of them. A grand external flight of steps in the front would have had a fine effect, and would have added immensely to the architectural value of the building, but the practical inconvenience, in this climate, for the intended uses of the hall, would have been so great as to be prohibitive. Another defect is that the imposing effect of monumental solidity which might have been obtained by the lofty podium is seriously interfered with by the cutting of an arcade into it at the lower end of the site, with a return arch at each end, absolutely necessary of course for passage, but which takes away all the solidity of effect from this end of the building, especially when viewed from one side, where the return arch seems to weaken materially the foundation on which the superstructure stands.

With all these defects of treatment, coupled with the fact that the style imitated is peculiarly unsuited to the atmosphere of a manufacturing town, it is impossible not to feel a certain respect for the old Classic Town-hall, more especially when comparing it with some of the structures in its vicinity. It stands well on its site; there is a breadth and repose about it which is in strong and advantageous contrast with the bustle and straining after effect which is characteristic of most of the modern Birmingham buildings. It should be noted that this, to begin with, is not the work of a Birmingham architect. There was an opportunity once for making it part of a grand architectural combination. This was at the time of the competition for the Municipal Buildings, when Mr. Lynn of Belfast sent in his splendid scheme for placing the new building on a line normal to the Town Hall, and connecting the latter with it by a bridge, so as to put the Town Hall *en suite* with the state-rooms of the proposed new building. The competition committee felt themselves debarred from giving the premium to a plan which contravened their instructions as to the lines of the site, but they showed their appreciation of it by purchasing from the author the right to use it, and—neglected any use of it. They thus lost for ever the opportunity of doing a great thing in Birmingham in the way of internal and external combination and climax; an arrangement which would have also given twice the architectural value and dignity and meaning to the old Town Hall. Now we have it flanked by, but entirely unconnected with, the huge mass of the Council House buildings, about as poor and commonplace a piece of Renaissance architecture (of a sort) as ever gave employment to a competition draughtsman. The general effect is flat and tame, there is not a detail in it worth looking at, and the campanile is perhaps one of the ugliest ever designed. But then it has the merit of being the work of a townsman. The façade of the older portion of the Midland Institute opposite forms an instructive contrast. This was the work of the late Mr. E. M. Barry, who did not, it must be admitted, inherit the genius of his father, but who had acquired a refinement in adopting Classic forms of architecture which at all events does not appear in the native architecture of modern Birmingham. Barry was much too fond of vases along the top of his buildings, a very commonplace detail; but the treatment of the order on the building and of the basement upon which it rests is carefully worked out; the proportions of the

whole elevation are good and harmonious; and though this kind of thing has had its day and is (like the Town Hall) unsuited to a manufacturing town in this climate, it is at any rate gratifying to see it well done in its way, and on the whole this façade may be said to be one of the best bits of architectural work in Birmingham. Its merit will be the more apparent if it be compared not only with the flabby Classic architecture of the Council House, but with the new Post-office buildings now approaching completion just below. This we presume is a piece of official architecture, and for once we may congratulate Birmingham on having set down in her streets, from a foreign source, something as coarse and commonplace in architectural design as any of her native developments. The display of vases on the balustrade of the Midland Institute buildings is a piece of elegant detail in comparison with the growths on the new Post-office buildings. Pots and tea-urns of abnormal dimensions are perched about on ledges and on cornices; the whole of it is fussy, pretentious, and totally wanting in dignity or breadth of effect. Things by no means so bad as this have been turned out from the Office of Works' mill; it is difficult to understand the production of anything so ostentatiously bad as this. Has it been the result of a kind of *spirituel* attempt to "harmonise with the environment"?

Some of the developments of Birmingham Gothic occupy the same neighbourhood of which the Town Hall forms, as we observed, the central feature. It is painful to feel that one cannot speak with much sympathy of the work of such a man as the late Mr. Chamberlain, who at heart was an artist in his wishes and intentions, an enthusiast in his work, and who certainly had a strong intention of doing something good for its own sake, and was in every way a man much and, we believe, most deservedly respected in his native town. But the Gothic addition which he made to the Midland Institute buildings is imbued with the same spirit of fussiness and coarseness of detail which seems to pervade everything produced in the town. The Lecture Hall within is even worse in this respect. It has indeed the great merit of being admirably adapted to its purpose in a practical sense, and is one of the few rooms in the country in which over a thousand people, seated on one floor, can be addressed and can hear without the least effort to the speaker. But the treatment of the room architecturally, with its brick fireworks on the wall, is almost irritating, and enough to put out of tune any one who goes there to lecture on anything connected with art. The School of Art is better, and the effort to give relief and brightness to the walls by the insertion of coloured tiles, and other devices, was thoroughly well meant, but the result is unfortunately patchy and inharmonious, though there is something of picturesque treatment in the general design.

The Mason College and the High School for Girls form two large blocks of Gothic building is such close contiguity as almost to make one group. The High School, originally built for the Birmingham Liberal Club but found too large for its purpose (rather a surprising result in a town supposed to be so radical in its politics as Birmingham), is much the best of the two externally, though both are by the same architect, and is perhaps the most favourable specimen of the class of Gothic work which obtains in Birmingham. The pretentious and what may be called jerky style of the architecture of this building, not without a certain degree of vigour, is of a type not of course confined to Birmingham; we find it in large Gothic buildings of the past twenty years in other large towns; but it has that same "note" of want of repose and refinement which is the general characteristic of the modern architecture of the town. Sir Charles Barry's "King Edward's Grammar School" in New-street is no doubt, from the point of view of the present day, very tame Gothic, and Gothic in fact was never Sir Charles Barry's strong point. But it is a useful and instructive contrast to even the best of the modern Gothic buildings in the town, in its character of refinement and good taste; it has not that air of striving after showy effect which the visitor to Birmingham meets with on every hand among the recent buildings. Taking the average street architecture of the town as exhibited in Corporation-street, which is the costliest street in Birmingham in this respect, the impression left on the mind is quite painful, the more so from the amount of display and the show of lavish expenditure in making buildings "ornamental," which is to be seen everywhere. While there are few business streets in any provincial town more "handsome," as the common expression is, than Corporation-street, there are few, perhaps none, in our recollection, that are so destitute of real architectural beauty and interest. If we begin to consider where the fault lies, we shall probably come to the conclusion that it is in want of refinement of detail, coupled with an exuberance of ornamentation which only serves to emphasise this defect the more. We see large coarse mouldings, heavy bands stuck on everywhere round shafts and columns, florid but coarsely-designed carving got in wherever it can be got in, as if architectural beauty was to be acquired by dint of loading a building with ornamental detail without consideration of the quality of the detail itself.

Is there any reason why this kind of thing should be so peculiarly prevalent in Birmingham? The causes which influence the special character of the architecture of a modern town are always difficult to trace, but we think that the taste of Birmingham has been influenced by the fact of its being a town largely occupied in industries of a practical kind, which require a great deal of energy and ability to carry them on successfully, which bring in a great deal of wealth, but which do not in any way tend to turn the attention towards the consideration of beauty in the objects produced. The wealth is there, and the desire to make an architectural show with it, which in one sense or another always follows the accumulation of wealth; but the feeling and taste which should preside over such architectural display have been less cultivated even than usual in modern cities, because the occupations from which much of the wealth has arisen are such as tend to deaden rather than to foster the artistic sense. A strong light is thrown upon this view of the subject by the style of ornamental *bijouterie* which is characteristic of Birmingham. A few years ago there were placed in the Art Museum Galleries (we know not if they are still there) cases of specimens of recent gold work by eminent Birmingham firms, to show, amid the ancient examples, what the modern jeweller could do. The whole style of these was that of work in which the chief desire was to show the costliness of the object, the thickness and weight of the gold and value of the stones set in it, without any attempt at beauty of design beyond the most commonplace devices of star-patterns, &c.; designs with no thought and no beauty in them. The mere sight of such work, as the best produce of the town in that way, would in itself lead one to expect that architectural refinement would find no home in such a region. The spirit which puts refined and thoughtful work into jewellery is the same spirit which puts refined and thoughtful work into architectural mouldings and architectural ornament; which leads to the perception that it is not the money value of the material and labour which makes a valuable work of art, but the thought of the designer, the patient striving after the best by the worker; and that a little ornament well placed and carefully designed is of infinitely more value than a great show of coarse and carelessly-designed work, whatever cost it may represent. This is the lesson which Birmingham, with all her energy and commercial success, needs to learn, and in this respect there may we hope be some teachings during the Congress of next week which may not be without value in the end, though they may not be popular at the moment.

Among the new buildings now getting up in Birmingham is a large corner block in Corporation-street, which we fear has all the characteristics we have already alluded to in modern Birmingham architecture, and the new buildings for the Prudential Assurance Company by Mr. Waterhouse higher up in the same street. We doubt whether this will prove, when it can be seen completely, one of the most successful of its distinguished architect's numerous works, but it is at all events free from that florid character of ornamentation of which so much is to be seen around. Opposite the new Law Courts some building is going on which we understand is a waterworks establishment, of which there is now evident a small building with some half timber work in front, and the commencement of a couple of towers; what is to come of this architecturally has yet to be learned.

The new Law Courts is of course by far the most important new building in Birmingham, and is an altogether new departure in Birmingham architecture. This also, as our readers are aware, is not by a Birmingham architect, but the joint design of two London architects, Mr. Aston Webb and Mr. Ingress Bell. The building is now complete architecturally, only the interior fitting remaining to be done; but the lofty hoarding in front prevents the total effect from the street being judged of as yet. As far as one can judge from inspection of a building before the actual traffic and business in its courts and corridors has commenced, the plan seems entirely admirable for its purpose. This is not one of your "rabbit-warren" plans, but one in which the whole scheme is simple and symmetrical, and every department and corridor seems just in its right place for the purposes of the building. By placing the great hall or *salle des pas perdus* parallel with the front, the architects have been enabled to connect it in a most convenient manner with the three main corridors which run up the building, from the centre and from the two ends of the large hall. Opposite the main entrance runs the centre corridor which leads between the civil and criminal courts and up to the semi-private corridor for the bench and the bar, which runs across the upper end of the building, and beyond which is the barristers' library. The side corridors give access to the minor courts, and rooms for various purposes in connexion with the courts. The public entrance to the galleries of the courts is entirely separate from the street, and keeps those who go merely as spectators entirely out of the way of those having business at the courts, as in the London Law Courts; but the access is more commodious and better arranged than in Street's building with its corkscrew staircase.

Detailed description of the building as completed we reserve for another occasion, our concern just now being rather with its architectural character. In this respect it is far in advance of any other recent building in Birmingham, and, as observed, constitutes almost a new departure, and gives a new architectural interest to the town. Whether the effect of the red terra-cotta is calculated entirely to convert one to the love of terra-cotta in place of stone may be a question. It is no doubt a much better material than stone for durability and retaining its appearance and effect in a smoky town, where the best stone buildings soon come to have a more or less grim aspect; but there is a smooth and almost waxy-looking texture about it which is not so effective as the texture of stone; and the material here used, though excellent of its kind and admirably worked, is to our thinking a little too deep a red for the best effect. Terra-cotta has of course the advantage over stone, besides durability in regard to atmospheric influence, that a great deal of decorative detail can be produced in it at less cost than by stone carving; but this advantage is not unaccompanied by drawbacks. The question of texture comes in again, and the ornament which would be carved if in stone, has a somewhat hard and cast-iron look in terra-

cotta. May we add also that we cannot but think the plastic character of the material has betrayed the architects into a somewhat too exuberant form of ornamentation in some places. The rounded mouldings and detached shafts of the external entrance, with the scrolls curling off the mouldings rather like wrought-iron ornament, have rather a want of repose and solidity of effect; and we regret to meet here and there with slight symptoms of what Fergusson called "the horrors of German interpenetration" of mouldings; in the heads of a good many of the corridor doors, for instance. The effect of the hall, with its heavy pitch-pine open timber roof and stained-glass windows, is indeed very rich and effective, and derives the more effect perhaps from the plain treatment of the floor (of Yorkshire stone slabs) and the simple but suitable treatment of the ground-floor doors. We could have wished that the arcades across the ends of the hall had not been of stilted arches; the evident object is to make the line of the impost coincide with the main surbase line of the hall, and thus bind the whole together; but a stilted arch is not a very satisfactory architectural form. The courts are very well treated both architecturally and practically, with some good wood and plaster work, not too ornate for the occasion; and the ceiling of the Grand Jury room is a very rich and effective piece of plaster decoration in low relief. The treatment of some of the leaded glass windows, as in the barristers' library, is exceedingly effective and well designed in a simple manner. Some of the overmantels in the principal rooms (*e.g.*, that in the barristers' library) again suggest a note of interrogation as to terra-cotta; the ornament and small figures in some of them give a general rich effect, but totally without the sharpness of carving. For the general lining of the walls of the interior, on the other hand, nothing could be more suitable than the light-coloured terra-cotta here employed, which combines a look of warmth and comfort with monumental effect. In the interior as well as in the front we find the ornament rather too exuberant in places, and would have liked the example to be set, in Birmingham especially, of reticence in this respect. But as a whole the façade presents a piece of rich architectural picturesqueness and originality of which there is certainly no other example at present in Birmingham.

NOTES.

A REMARKABLE episode in the capital and labour war occurred last week in reference to the Australian strike. A telegram from the strikers in the Antipodes, which ran thus: "Require 20,000*l.* United Australian Unions guarantee repayment. Success assured," was read at a special meeting of the London Trades Council. It was decided that this sum should be raised. This incident is very important. It emphasises in the most vivid manner the international character which these disputes have now reached. It will also bring home very keenly to the English working man the costliness and the waste of strikes. We hope it will make him pause and consider whether the use of strikes may not be carried too far. The money must come out of the pockets of the working men, and if higher wages are to be spent in taxes of this sort, is the working man much better off for the increase in his remuneration? But if it comes to a fight between money-bags, which is most likely to succeed, the capitalist or the labouring man? It is true that Mr. Tom Mann observed that "many of the unions were very rich," which is, perhaps, the cause of their aggressiveness, but rich unions merely mean that money has been collected from the working classes for the propagation of strikes. Thus it is again shown that what the working man receives with one hand in the way of increased pay from his employer he hands with the other to his union. That strikes are sometimes necessary is undeniable, but it is obvious that when thousands of pounds are asked for, and it is boasted that the unions are "very rich," we have quite got beyond the period of legitimate strikes for reasonable wages.

THE resolution of the Court of Common Council to promote a Bill next session to establish a Commission to manage the water-supply of the Metropolis, either by taking over the present water companies' undertakings or by establishing an alternative supply, is likely to have important consequences. The Corporation of London is not a Radical body, and the fact that it has, after due consideration and investigation, taken this step shows that popular opinion is ripe for an end being put to the supply of water to London by private enterprise. It is also a welcome sign of public spirit. Should the scheme be carried out, it will have an extraordinarily vivifying effect on the Corporation. It will be useless to speak of it as an effete body, it will have accomplished a great and valuable public work, which will prevent any one from saying that it is an effete and worn-out body. It remains, of course, to be seen how events turn out, but, taken up by practical men, acting on behalf of the people of London, the matter is likely to have a more successful issue than if it were taken in hand by a Government, which can take no step of the sort without laying itself open to political attacks from some quarter, and which has to be constantly on the alert not to hurt the feelings of its supporters. The sooner the Water Companies are bought out on reasonable terms, the better it will be for the people of London.

AN important conference was held at the Board of Trade on Tuesday between the officials of the Department and a deputation of railway managers, upon the question of rates and charges for merchandise. The object of the deputation was to convince the Department that the adoption of the schedules of maximum rates which they have recommended would involve losses of revenue as compared with the present actual charges. Summaries were handed in showing the amount of loss which would thus be sustained:—The London and North-Western being calculated at 113,600*l.*, the Midland at 117,700*l.*, Great Northern 34,489*l.* (!) and so on, the Brighton Company—who do not depend upon goods traffic for revenue,—closing the list with 4,000*l.* The companies have arrived at the conclusion that, although there is nothing to complain of in the principles which guided the Board of Trade in compiling their schedules, the schedules themselves fail to give due and fair effect to those principles. Sir Michael Hicks-Beach, in his reply, took occasion to refer to the directions to the Board of Trade which the Bill contained as originally drafted, as to the principle upon which maximum rates should be fixed, which were struck out, leaving simply the words "just and reasonable." He declined to enter into any argument, preferring to wait for the traders' answer to the statements now made. It is understood that these, together with the statistics to which we have alluded, will be made public, and they will doubtless be challenged. Of course, any inquiry into these figures would be of a public character.

IN regard to the question so much debated at present as to the ventilation of sewers whether by street-grids or by high ventilating shafts, the following extract from an article in the *Lancet* may be of interest to some of our readers as representing a medical opinion on the subject:—

"That the gases bred of putrefactive processes in sewers must be allowed some means of escape other than into our houses no one doubts; but while some advocate putting the vent-holes at the street level, others advise the use of ventilating chimneys which shall conduct the effluvia above the roofs of the houses. The sewer grating, be it remembered,

'like the toad, ugly and venomous,
Wears yet a precious jewel in his head,'

by which we mean that the stench arising from a sewer when rightly considered has its uses, for it ought to make us instantly take measures to remove the cause of offence by flushing, disinfection, or other means. Sewage is so offensive to the eye that we have put it out of sight, and by so doing we deprive ourselves of the protection of one of our senses. If we take measures which will prevent our smelling it, we deprive ourselves of the protection of another of our senses. It must not be forgotten that by the use of high ventilating shafts we do nothing to stop the putrefactive process which is the cause of the mischief. The gases which result from putrefactive processes are not probably very dangerous to health, and those delivered at the roof level would be diluted beyond recognition before they struck the nose of a passenger in the street, although it might be otherwise with the denizens of the attics. There can be no question that offensive gas gives less annoyance to the nose when given off by a high chimney than when discharged in a confined space flanked by houses. As regards the infective microbes which, infinitively small though they be, are distinctly ponderable, it is at least conceivable that those having to fall to earth through 60 or 80 ft. would stand a better chance of being inhaled or swallowed than when delivered at the street level. On a sultry July day there comes a heavy downpour, and the torrent flowing to the sewer causes a copious escape of gas from the high ventilators. Infective microbes accompanying the gases are washed down by the rain, and in falling past the windows of five or six stories, and so to the ground, have a better chance of being inhaled than when they are battered to earth again as soon as they emerge from the street grating. We have learnt by experience how infective particles escaping from the small-pox hospitals drift about to the neighbouring houses, and we must admit that the same kind of thing might happen in the case of infective particles given off from the high ventilating shafts."

IT is the fashion of politicians to regard a session as fruitful or barren according as it is prolific or barren in regard to sensational political measures. Many people regard such legislation as of less importance than mere homely Acts of Parliament. One of these passed last session is the Housing of the Working Classes Act, 1890, a measure of 103 sections, without taking into account the several schedules. It is very largely a Consolidating Act, for it repeals all the previous Artisans and Labourers' Dwellings Acts, and also the Housing of the Working Classes Act, 1885, except sections three and seven to nine. The full advantage of such a consolidation as this will be better appreciated when we point out that between 1851 and 1885 inclusive, no less than fourteen Acts of Parliament were passed dealing with working men's dwellings, most of these containing amendments of preceding statutes. In such a Consolidation Act various amendments of the existing law are necessarily to be found, but they can hardly be profitably noted in any other way than by a verbatim comparison of the last Act with those which have gone before. In regard to the part entitled "Powers of County Councils," we have already referred to the circular of the President of the Local Government Board on the subject of appeals to those bodies against the inaction of sanitary authorities. The practical value of the procedure yet remains to be seen.

SINCE the passing of the Railway and Canal Traffic Act the railway companies generally have been looking rather sharply after "extras,"—such as warehousing and wharfage, and the charges for use of sidings. We notice that the Midland Railway Company took a case of this description into the County-court at Bedford last week, a coal dealer in a small way of business being sued for 15*l.* 11*s.*, "for rent of siding accommodation since March, 1889." The company issued a notice in February last year stating that on and from March 1 they would charge a shilling per wagon per day for siding rent upon all wagons not unloaded within four days after arrival. It was added that this step was rendered absolutely necessary by the increasing detention of wagons, which greatly impeded the working of the railway. There is no doubt that some merchants take a most unreasonable advantage in this way, and it is to be noted that the County-court Judge upheld the right of the company to make these charges, giving judgment in the case referred to for the

full amount, with costs. At most stations stacking-ground is provided, for which a rent is charged; and it is not likely that the company care to have their sidings blocked by traffic belonging to persons who do not take sufficient stacking-ground to accommodate it. In this matter, however, as in others, the weakest are the most likely to suffer. A clause in the notice provides that the company may enter into an agreement whereby a trader may be allowed to take an *average* of four days upon each wagon consigned to him during each month, the average being ascertained at the end of each month. Thus, a large merchant would be able to leave some of his trucks under load for the greater part of the month, claiming as a set-off those which are liberated on the day of arrival. The smaller merchant cannot manage these things so conveniently, and, it seems, has to pay the penalty.

SOME anxiety has been expressed as to a threatened restoration of the interesting timber church at Greensted in Essex, of which a sketch is subjoined; and a few words as to what is really the state of the church, from a special visit of inspection, may be of interest. Greensted is close to Chipping Ongar, and a path of about three quarters of a mile through the "Avenue" of Greensted Hall leads to the church. Formerly a simple wooden building, built it is supposed as a resting-place for the body of St. Edmund on its way to Bury, it is now a small church, consisting of nave, chancel, and western tower, with a projecting porch on the south side. The walls of the nave appear

Greensted Church, Essex.

to be the original fabric, and are of wood logs about 4 ft. 4 in. in length, and varying between 2 ft. and 3 ft. in width. They rest on a plinth of brick, and above them is the plate which carries the roof. There being no windows in the walls, this part of the church is lighted by six dormers, three on either side. The tower is of wood, with a shingle broach spire. The chancel is of brick, including the jambs of the windows and priest's door. The east window is of stone, and likewise the inner order of a modern window on the south side eastwards of the priest's door. During 1848-9 the church was extensively restored, and the roof of the nave with its dormers, and the south porch, are practically new. Unfortunately proper care was not taken to ventilate this roof under the boarding, and dry-rot has attacked it, rendering the renewal of the roof again necessary. There is one fragment of old glass—a head, appearing to be that of Henry VII., and probably coeval with the building of the chancel. On the north wall, inside the chancel, is a good mural monument to [illegible], sister of Sir Thos. Smith, of Mont, and second wife of Alane Wood, of Snodhill, [illegible], but this is the only object of interest. We give the south-east view of the church, and the panel in the corner is a part of the monument just mentioned, the upper portion, with the shield of arms in a circular panel, having been omitted.

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LETTER FROM PARIS.

THE promised road from the Avenue Suffren to the Avenue Bourdonnais, across the Champs de Mars, has now been made, and there is talk of another carriage road to be continued from the Pont d'Iena round the Eiffel Tower to the central dome, winding round by the Palais des Arts Libéraux on the way. There is an idea of making this a kind of rival to the Champs Elysées and the Bois de Boulogne as a promenade, though it may be doubted whether this will be accomplished, and it is evident also that, now that the conservation of the principal Exhibition buildings has been determined upon, there is some difficulty as to what to do with them. M. Alphand has a number of projects which are to turn them to account. The Galerie des Machines is talked of as a winter place for grand displays of equitation, a kind of hippodrome; but it is doubtful whether this would be a success, at all events it is not likely to draw the fashionable world of Paris.

The Metropolitan Railway scheme is more talked of than ever, but without apparently coming any nearer to realisation. It is the object of numberless public meetings and of a great deal of press warfare. The supporters of M. Haag's viaduct scheme criticise warmly the subterranean scheme of M. Eiffel. This latter scheme was not really anything more than a circle railway for the centre of Paris; a circle starting from the Madeleine, underground, passing by Rue Taitbout, the Faubourgs Montmartre and Poissonière, the Boulevard de Strasbourg, the Place de la République, the Rue Oberkampf and Rue du Chemin Vert, the railway stations of Vincennes, Lyons and Orléans, the Pont Sully, the Pont Louis Philippe, the Boulevard Sébastopol, the Pont Neuf, the Rue du Louvre, the Palais Royal, the Rue des Pyramides, the Rue Castiglione, and the Place de la Concorde. The plan is a very defective one, and it is objected with reason that it would not be worth while to burrow and tunnel for years in the middle of Paris to get a subterranean line which would leave out of connexion the Gare St. Lazare and the Gare du Nord. Now, the number of passengers passing through Gare St. Lazare alone during the past year has been 30,280,000, a total not to be despised. It is objected also that M. Eiffel has not taken into consideration the difficulty of the subsoil lake which caused M. Garnier such trouble in forming the foundations of the Opera House. It will need gigantic pumping operations to render this portion of the ground fit for a railway. The great system of sewers laid out under Belgrand will also be encountered, at more than one point, by the Eiffel line. To get over this obstacle would need another complete pulling up of streets which have already for the last six months been devastated by the operations of the electric light companies.

Nevertheless the idea of a Metropolitan Railway has taken such hold on the public mind of Paris that many people are disposed to accept any scheme, the best they can obtain if not the best in itself, which would contribute something to facility of locomotion in Paris. The Committee dealing with the subject has also required important modifications in the scheme, among them that of a branch line from the Gare St. Lazare to the Madeleine, another from the Square Cluny to the Gare d'Orléans by the Boulevard St. Germain, and a connexion with the line which the Compagnie du Nord intend to push forward to the Halles Centrales. These important modifications or rather additions have been accepted by the Eiffel Company, and in a few days the Municipal Council will discuss the whole project in this form.

The art exhibitions recommence with the autumn. That of the "Blanc et Noir" has commenced the series in the Pavillon de la Ville de Paris, on the Champs Elysées. This exhibition, the fourth of its class, includes no less than 1,500 drawings, pastels, engravings, etchings, &c. There are some very remarkable works there, among the foremost of which must be mentioned the remarkable cartoons, "Ludus pro patriâ" and "Légende de St. Geneviève," exhibited by M. Puvis de Chavannes; the drawings of M. Charles Jacques; the sketches of MM. Forain, Pille, Renouard, and Régamy, and the last drawings made by M. John Lewis Brown, whom a lingering but hopeless illness has unhappily debarred from any more exercise of his art.

The Service des Beaux-Arts has opened at the Hôtel de Ville an interesting exhibition of the works which were sent in competition for the decoration of the Galerie Lobau in the Hôtel de Ville. This gallery, which runs parallel with the Salle des Fêtes for its whole length, includes nineteen cupolas and two half cupolas. It has been already the object of one competition which came to nothing. We now find forty-six competitors, among whom are many names well known to the public. M. Charles Toché, the author of the decorations of Chenonceaux, has sent a series of watercolours, very spirited works, symbolising the leading corporations of Paris. M. Chabas, who has already obtained in competition the decoration of the Mairie of the fourteenth arrondissement, has associated himself with a talented young architect, M. Maubert, in a series of designs personifying the ancient and modern fêtes of Paris. M. Guillaume Dubufe has designed a green and gold scheme of decoration, with allegorical figures. M. Lucas sends a well-composed and interesting design. Many architects have entered into the competition independent of any aid from painters. Among these are M. Hourlier, whose design for "Les Mois" are very pleasing, and M. Despouy (Prix de Rome, 1884), whose ingenious designs are shown in black on a sky-blue ground, with very unfortunate effect. Of the political allegories (always too numerous on these occasions), the historical Republican scenes, and the apotheoses of revolutionary heroes, it is hardly necessary to speak, except to observe that they are entirely out of place in a decorative scheme of this nature. There are no doubt some very good designs, but no one of them seems to us to have realised what is required for a gallery in such a position, partially connected with a grand hall, and of which the decoration ought to form a portion of the scheme for the hall itself. Is it to be recognised that, at the close of the nineteenth century, the decorative art of France is in its decadence?

The centenary of the foundation of the Louvre Museum falls next year on the 26th of May. Many Parisian journals are proposing that this should be made the occasion of a public fête. Without going so far as that, we quite agree that the occasion may well be commemorated in some manner, either by the erection of a monumental group in marble or bronze, or by the issue of a medal; both which proposals have been made. In the meantime it is much to be regretted that the Louvre has not space at present for all the treasures which it possesses, and much to be wished that the Pavillon de Flore, no longer occupied by the Préfecture of the Seine, should be made use of to exhibit works which are now hidden away in attics. Regnault's celebrated picture of "Maréchal Prim" was thus hidden away, and when the public demanded its production, it was necessary to remove Gericault's "Cuirassier"; and the same thing has happened in other cases, and the utilisation of the Pavillon de Flore for the purposes of the Museum entirely is the only way out of the difficulty.

In the matter of new buildings Paris has now possessed, for some days, the "Casino de Paris." This large block, between Rue Blanche and Rue de Clichy (on which latter is the principal façade), includes a hall of 2,000 square mètres of area, and 18 mètres high, the roof carried by a double row of light columns with caryatides at the top. This concert-room or ball-room, whichever it is to be, surrounded by a loggia, forms the vestibule to a "salle de spectacle" which will seat 1,600 persons. The whole is blazing with gilding, and is lighted by 2,000 electric lights; it is effective enough, but in a heavy and tasteless manner. The façade is hardly worth mention, except that the centre portion is occupied by an immense window which is filled with stained glass by Champigneulles, with a design signifying music, dancing, &c., according to the usual tendency of the decorations in places of public amusement of this kind.

The works at the Galliera Museum are advancing by slow degrees. The architect (M. Ginain) intends to construct in front of the principal façade a staircase which will be reached across a floor or court paved with mosaics. On the other side, the sculpture of the gable surrounding the pavilion which faces the Rue Pierre Charron has just been completed. The gable itself is decorated with the letters G. B. interlaced (Galliera-Brignolles).

The Minister of Public Works has given the order to proceed with the reinstating of the cornices, balconies, and colonnettes decorating the interior façades of the Palais Royal.

A few days since the École des Beaux-Arts opened the exhibition of the works executed at Rome, in 1889, at the Villa Medicis. Among the architectural works M. Tournaire, a first year's pupil, exhibits four sheets of details of the Forum of Trajan and a drawing of a votive altar from the Vatican Museum. M. Chédanne, a second year's pupil, has sent in ten sheets of drawings, including a remarkably fine one of the Theatre of Marcellus; M. Defrasse (third year) sends plans, sections and details of the theatre at Epidaurus, and a drawing of the Ca d' Oro at Venice; and M. André (fourth year) has sent a restoration of the Forum and theatre at Ostia. The jury has given judgment on the architectural drawings of the first class of architectural students. Among fifty-eight designs sent in for the subject of "A Pantheon," second medals have been awarded to M. Bauhain, pupil of MM. André and Laloux; to M. Vallat, pupil of MM. Douillard and Thierry; and to M. Desperthes, pupil of his father and of M. Ginain. In the sketch competition second medals have been awarded to M. Schule and M. Closson, pupils of M. Ginain.

A few days previously, the competition for the Sèvres prize took place, the subject of which, as before mentioned, was a table service and dessert service. Out of eleven designs submitted, the prize was awarded to M. Fournier, and three equal prizes to MM. Bonafoux, Maldémé, and Sandoz; all four being pupils in the National manufactory at Sèvres.

We regret to record the death on October 16, of the painter Auguste Toulmouche, author of many charming *genre* pictures which have been popularised by engravings and photographs. He was born at Nantes in 1829, and came at an early age to Paris to study in the atelier of Gleyre, and exhibited his first work, a portrait, at the Salon at the age of nineteen. His early works after this were historical subjects, one of which gained him a third medal in the Salon of 1852. But he soon abandoned classic painting for *genre* and scenes of modern life, for which he obtained a great reputation. Among the best known are "Le Terrasse," "Après le Déjeûner," "Le Premier Chagrin," "Le Lendemain du Bal," "Un Mariage de Raison," "Le Lilas Blanc," &c. He received medals also in the Salons of 1861 and 1878, and in the great Exhibition of last year. He was a man much liked among those who knew him, and not spoiled by success.

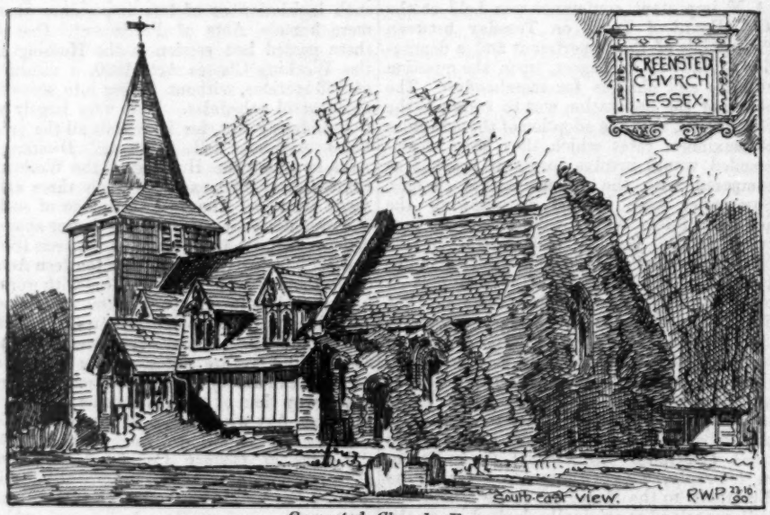
We have to mention also the death of M. Gaston Melingue, former pupil of Léon Cogniet, who exhibited many times at the Salon; his last year's picture being "La Cigale et la Fourmi." He was a son of the eminent actor Melingue who created the part of Benvenuto Cellini at the Porte St. Martin Theatre, and who was also a sculptor of great ability.

THE ENGLISH IRON TRADE.—There is scarcely any change in the English iron market. Business is quiet, but a steady tone continues to prevail. In pig-iron trade is still restricted, and the greater part of such iron as is required for immediate wants is either supplied by second-hand holders or drawn from stocks, makers declining to sell except at their own prices. There has not been much fluctuation in Scotch warrants, but the tendency has been upwards. Middlesbrough pig is practically unchanged. Bessemer iron in the North-west is quiet, but steady, and the consumption is larger than the output. A moderate business is doing in finished iron, rates being tolerably steady. In steel a fairly active demand prevails, with prices firm. Shipbuilders and engineers continue busy.—*Iron*.

FRENCH GALLERY, PALL-MALL.—The private view at the French Gallery, 120, Pall-Mall, has been postponed from October 25 to November 15, in consequence of the death of Mr. Henry Wallis, the well-known owner of the Gallery, under whose management so many interesting exhibitions have been held there. The exhibition to be opened on the 15th will consist of a collection of the works of Mr. B. W. Leader, A.R.A.

full amount, with costs. At most stations stacking-ground is provided, for which a rent is charged; and it is not likely that the company care to have their sidings blocked by traffic belonging to persons who do not take sufficient stacking-ground to accommodate it. In this matter, however, as in others, the weakest are the most likely to suffer. A clause in the notice provides that the company may enter into an agreement whereby a trader may be allowed to take an *average* of four days upon each wagon consigned to him during each month, the average being ascertained at the end of each month. Thus, a large merchant would be able to leave some of his trucks under load for the greater part of the month, claiming as a set-off those which are liberated on the day of arrival. The smaller merchant cannot manage these things so conveniently, and, it seems, has to pay the penalty.

SOME anxiety has been expressed as to a threatened restoration of the interesting timber church at Greensted in Essex, of which a sketch is subjoined; and a few words as to what is really the state of the church, from a special visit of inspection, may be of interest. Greensted is close to Chipping Ongar, and a path of about three quarters of a mile through the "Avenue" of Greensted Hall leads to the church. Formerly a simple wooden building, built it is supposed as a resting-place for the body of St. Edmund on its way to Bury, it is now a small church, consisting of nave, chancel, and western tower, with a projecting porch on the south side. The walls of the nave appear



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LETTER FROM PARIS.

THE promised road from the Avenue Suffren to the Avenue Bourdonnais, across the Champs de Mars, has now been made, and there is talk of another carriage road to be continued from the Pont d'Iena round the Eiffel Tower to the central dome, winding round by the Palais des Arts Libéraux on the way. There is an idea of making this a kind of rival to the Champs Elysées and the Bois de Boulogne as a promenade, though it may be doubted whether this will be accomplished, and it is evident also that, now that the conservation of the principal Exhibition buildings has been determined upon, there is some difficulty as to what to do with them. M. Alphand has a number of projects which are to turn them to account. The Galerie des Machines is talked of as a winter place for grand displays of equitation, a kind of hippodrome; but it is doubtful whether this would be a success, at all events it is not likely to draw the fashionable world of Paris.

The Metropolitan Railway scheme is more talked of than ever, but without apparently coming any nearer to realisation. It is the object of numberless public meetings and of a great deal of press warfare. The supporters of M. Haag's viaduct scheme criticise warmly the subterranean scheme of M. Eiffel. This latter scheme was not really anything more than a circle railway for the centre of Paris; a circle starting from the Madeleine, underground, passing by Rue Taitbout, the Faubourgs Montmartre and Poissonière, the Boulevard de Strasbourg, the Place de la République, the Rue Oberkampf and Rue du Chemin Vert, the railway stations of Vincennes, Lyons and Orléans, the Pont Sully, the Pont Louis Philippe, the Boulevard Sébastopol, the Pont Neuf, the Rue du Louvre, the Palais Royal, the Rue des Pyramides, the Rue Castiglione, and the Place de la Concorde. The plan is a very defective one, and it is objected with reason that it would not be worth while to burrow and tunnel for years in the middle of Paris to get a subterranean line which would leave out of connexion the Gare St. Lazare and the Gare du Nord. Now, the number of passengers passing through Gare St. Lazare alone during the past year has been 30,280,000, a total not to be despised. It is objected also that M. Eiffel has not taken into consideration the difficulty of the subsoil lake which caused M. Garnier such trouble in forming the foundations of the Opera House. It will need gigantic pumping operations to render this portion of the ground fit for a railway. The great system of sewers laid out under Belgrand will also be encountered, at more than one point, by the Eiffel line. To get over this obstacle would need another complete pulling up of streets which have already for the last six months been devastated by the operations of the electric light companies.

Nevertheless the idea of a Metropolitan Railway has taken such hold on the public mind of Paris that many people are disposed to accept any scheme, the best they can obtain if not the best in itself, which would contribute something to facility of locomotion in Paris. The Committee dealing with the subject has also required important modifications in the scheme, among them that of a branch line from the Gare St. Lazare to the Madeleine, another from the Square Cluny to the Gare d'Orléans by the Boulevard St. Germain, and a connexion with the line which the Compagnie du Nord intend to push forward to the Halles Centrales. These important modifications or rather additions have been accepted by the Eiffel Company, and in a few days the Municipal Council will discuss the whole project in this form.

The art exhibitions recommence with the autumn. That of the "Blanc et Noir" has commenced the series in the Pavillon de la Ville de Paris, on the Champs Elysées. This exhibition, the fourth of its class, includes no less than 1,500 drawings, pastels, engravings, etchings, &c. There are some very remarkable works there, among the foremost of which must be mentioned the remarkable cartoons, "Ludus pro patriâ" and "Légende de St. Geneviève," exhibited by M. Puvis de Chavannes; the sketches of MM. Forain, Pille, Renouard, and Régamy, and the last drawings made by M. John Lewis Brown, whom a lingering but hopeless illness has unhappily debarred from any more exercise of his art.

The Service des Beaux-Arts has opened at the Hôtel de Ville an interesting exhibition of the works which were sent in competition for the decoration of the Galerie Loban in the Hôtel de Ville. This gallery, which runs parallel with the Salle des Fêtes for its whole length, includes nineteen cupolas and two half cupolas. It has been already the object of one competition which came to nothing. We now find forty-six competitors, among whom are many names well known to the public. M. Charles Toché, the author of the decorations of Chenonceaux, has sent a series of watercolours, very spirited works, symbolising the leading corporations of Paris. M. Chabas, who has already obtained in competition the decoration of the Mairie of the fourteenth arrondissement, has associated himself with a talented young architect, M. Maubert, in a series of designs personifying the ancient and modern fêtes of Paris. M. Guillaume Dubufe has designed a green and gold scheme of decoration, with allegorical figures. M. Lucas sends a well-composed and interesting design. Many architects have entered into the competition independent of any aid from painters. Among these are M. Hourlier, whose design for "Les Mois" are very pleasing, and M. Despouy (Prix de Rome, 1884), whose ingenious designs are shown in black on a sky-blue ground, with very unfortunate effect. Of the political allegories (always too numerous on these occasions), the historical Republican scenes, and the apotheoses of revolutionary heroes, it is hardly necessary to speak, except to observe that they are entirely out of place in a decorative scheme of this nature. There are no doubt some very good designs, but no one of them seems to us to have realised what is required for a gallery in such a position, partially connected with a grand hall, and of which the decoration ought to form a portion of the scheme for the hall itself. Is it to be recognised that, at the close of the nineteenth century, the decorative art of France is in its decadence?

The centenary of the foundation of the Louvre Museum falls next year on the 26th of May. Many Parisian journals are proposing that this should be made the occasion of a public fête. Without going so far as that, we quite agree that the occasion may well be commemorated in some manner, either by the erection of a monumental group in marble or bronze, or by the issue of a medal; both which proposals have been made. In the meantime it is much to be regretted that the Louvre has not space at present for all the treasures which it possesses, and much to be wished that the Pavillon de Flore, no longer occupied by the Préfecture of the Seine, should be made use of to exhibit works which are now hidden away in attics. Regnault's celebrated picture of "Maréchal Prim" was thus hidden away, and when the public demanded its production, it was necessary to remove Gericault's "Cuirassier"; and the same thing has happened in other cases, and the utilisation of the Pavillon de Flore for the purposes of the Museum entirely is the only way out of the difficulty.

In the matter of new buildings Paris has now possessed, for some days, the "Casino de Paris." This large block, between Rue Blanche and Rue de Clichy (on which latter is the principal façade), includes a hall of 2,000 square mètres of area, and 18 mètres high, the roof carried by a double row of light columns with caryatides at the top. This concert-room or ball-room, whichever it is to be, surrounded by a loggia, forms the vestibule to a "salle de spectacle" which will seat 1,600 persons. The whole is blazing with gilding, and is lighted by 2,000 electric lights; it is effective enough, but in a heavy and tasteless manner. The façade is hardly worth mention, except that the centre portion is occupied by an immense window which is filled with stained glass by Champigneulles, with a design signifying music, dancing, &c., according to the usual tendency of the decorations in places of public amusement of this kind.

The works at the Galliera Museum are advancing by slow degrees. The architect (M. Ginain) intends to construct in front of the principal façade a staircase which will be reached across a floor or court paved with mosaics. On the other side, the sculpture of the gable surrounding the pavilion which faces the Rue Pierre Charron has just been completed. The gable itself is decorated with the letters G. B. interlaced (Galliera-Brignolles).

The Minister of Public Works has given the order to proceed with the reinstating of the cornices, balconies, and colonnettes decorating the interior façades of the Palais Royal.

A few days since the École des Beaux-Arts opened the exhibition of the works executed at Rome, in 1889, at the Villa Medicis. Among the architectural works M. Tournaire, a first year's pupil, exhibits four sheets of details of the Forum of Trajan and a drawing of a votive altar from the Vatican Museum. M. Chédanne, a second year's pupil, has sent in ten sheets of drawings, including a remarkably fine one of the Theatre of Marcellus; M. Defrasse (third year) sends plans, sections and details of the theatre at Epidaurus, and a drawing of the Ca d' Oro at Venice; and M. André (fourth year) has sent a restoration of the Forum and theatre at Ostia. The jury has given judgment on the architectural drawings of the first class of architectural students. Among fifty-eight designs sent in for the subject of "A Pantheon," second medals have been awarded to M. Bauhain, pupil of MM. André and Laloux; to M. Vallat, pupil of MM. Douillard and Thierry; and to M. Desperthes, pupil of his father and of M. Ginain. In the sketch competition second medals have been awarded to M. Schule and M. Closson, pupils of M. Ginain.

A few days previously, the competition for the Sèvres prize took place, the subject of which, as before mentioned, was a table service and dessert service. Out of eleven designs submitted, the prize was awarded to M. Fournier, and three equal prizes to MM. Bonafoux, Maldémé, and Sandoz; all four being pupils in the National manufactory at Sèvres.

We regret to record the death on October 16, of the painter Auguste Toulmouche, author of many charming *genre* pictures which have been popularised by engravings and photographs. He was born at Nantes in 1829, and came at an early age to Paris to study in the atelier of Gleyre, and exhibited his first work, a portrait, at the Salon at the age of nineteen. His early works after this were historical subjects, one of which gained him a third medal in the Salon of 1852. But he soon abandoned classic painting for *genre* and scenes of modern life, for which he obtained a great reputation. Among the best known are "Le Terrasse," "Après le Déjeûner," "Le Premier Chagrin," "Le Lendemain du Bal," "Un Mariage de Raison," "Le Lilas Blanc," &c. He received medals also in the Salons of 1861 and 1878, and in the great Exhibition of last year. He was a man much liked among those who knew him, and not spoiled by success.

We have to mention also the death of M. Gaston Melingue, former pupil of Léon Cogniet, who exhibited many times at the Salon; his last year's picture being "La Cigale et la Fourmi." He was a son of the eminent actor Melingue who created the part of Benvenuto Cellini at the Porte St. Martin Theatre, and who was also a sculptor of great ability.

THE ENGLISH IRON TRADE.—There is scarcely any change in the English iron market. Business is quiet, but a steady tone continues to prevail. In pig-iron trade is still restricted, and the greater part of such iron as is required for immediate wants is either supplied by second-hand holders or drawn from stocks, makers declining to sell except at their own prices. There has not been much fluctuation in Scotch warrants, but the tendency has been upwards. Middlesbrough pig is practically unchanged. Bessemer iron in the North-west is quiet, but steady, and the consumption is larger than the output. A moderate business is doing in finished iron, rates being tolerably steady. In steel a fairly active demand prevails, with prices firm. Shipbuilders and engineers continue busy.—*Iron.*

FRENCH GALLERY, PALL-MALL.—The private view at the French Gallery, 120, Pall-Mall, has been postponed from October 25 to November 15, in consequence of the death of Mr. Henry Wallis, the well-known owner of the Gallery, under whose management so many interesting exhibitions have been held there. The exhibition to be opened on the 15th will consist of a collection of the works of Mr. B. W. Leader, A.R.A.

A NEW BOILER-TUBE.

During last week some boiler trials were made at the works of the great Sheffield steel-makers, Messrs. John Brown & Co., Limited. As these trials are likely, so far as can be judged, to have a considerable influence on the engineering practice of the future we will give a few details of them, and also of the invention which they were intended to test.

This invention is of French origin and is of the simplest description. In place of the ordinary plain cylindrical boiler-tube, M. Serve, the inventor of this new tube, places on the inside eight continuous longitudinal ribs which project radially into the interior of the tube. These ribs are in depth (or height) about one quarter of the inside diameter of the tube. The object, of course, is to give additional surface for the absorption of heat from the gases and products of combustion passing through the tubes from the furnace, or combustion-chamber, to the smoke-box. It is a well-known fact that the stream of gases passing through a tube is generally hotter in the centre, or core; the parts which have been cooled by contact with the metal of the tube remaining on the outside of the column as it passes; or, in other words, the gases travel in straight lines parallel to the axis of the tube. This being the case, it will be at once seen how effective in tapping the flow of heat these projecting ribs are likely to be. It may be objected that although there is more surface for the collection of heat from the gases, there is not any additional surface for the transmission of heat to the water of the boiler, as the outside of the Serve tube is the same as that of an ordinary tube; in fact, that there would be a throttling of the flow of heat at the base of the ribs. The answer to this objection is that the chief resistance to the flow of heat through metal is experienced at the surfaces, and that once the heat is absorbed by the metal it can travel through the interior with great facility. This fact, the knowledge of which was first deduced from theoretical reasoning, has been amply proved by practical experiment; and it is well known to engineers that two boiler-plates of, say, ½ in. placed together, will not transmit heat so readily as one of 1 in., because of the increased surface resistance. Having said so much of the theory of the Serve tube, we will give a few practical details.

Some time ago the French Admiralty made a very exhaustive trial of the Serve system at the Dockyard at Brest. A boiler of ordinary construction was set apart for the purpose. It was first fitted with ordinary brass tubes, and tested under certain conditions. These tubes were then taken out, and Serve tubes of brass were fitted. We have before us a copy of the official report, but, without wearying our readers with the elaborate and complete details which are characteristic of French reports, we may give the chief results obtained in brief.

The heating-surface of the boiler was 375 square feet, and the grate surface 14½ square feet. There were sixty-four tubes, 6 ft. 7¼ in. in length, and 3 in. outside diameter. The height of chimney was 40 ft. 8 in., the diameter being 18 in. The trials lasted over several days, and resulted in the following percentages of gain due to the Serve tubes:—

First day with natural draught	13·9	per cent.
Second ditto	15·6	,,
First day with forced draught at 1 11/32 inches	17·2	,,
Second day, ditto, at 1 3/16 inches	20·4	,,
Third day, ditto, at 1 inch	22·2	,,
Fourth day, ditto, at 3/32 inch	19·8	,,

We will not pause to comment on these remarkable figures, the importance of which is apparent on their face. The only thing against them, at the time they were made known in England, was that they were considered too good to be true.

Last week we had, however, the trials at Sheffield, to which allusion has already been made. The high standing of the firm making the experiments, and the fact that they were carried out under the inspection of several well-known engineers, including Mr. Ellis, of the Admiralty, and Mr. Milton, the Chief Engineer of Lloyds, was guarantee that everything would be done to ensure a fair trial. We may also be permitted to add our testimony to the willingness shown to allow the results to be verified in every way possible.

For the purposes of trial two ordinary return tube boilers had been constructed, each 10 ft. 6 in. long, and 10 ft. 6 in. in diameter, and exactly alike in all respects excepting that one had plain ordinary tubes, and the other Serve tubes. In each there were 126 tubes of 3¼ in. outside diameter. In each boiler the area of grate surface was 31 square feet. The total area of heating surface in the Serve tubed (No. 1) boiler was 1,536 square feet, and of the boiler with ordinary tubes (No. 2) 956 square feet; the difference being entirely due to the ribs on the tubes being calculated as effective heating-surface. The total area for passage of gases through tubes was 802·36 square inches in No. 1 boiler, and 852·18 square inches in No. 2 boiler. This difference again was due to the ribs in the tubes only. The boilers were fitted with fans in the chimneys, so as to give an accelerated draught on the Martin principle. The coal used was of the very best quality, being Nixon's Navigation.

The trials commenced on Tuesday of last week, the 21st inst., there being a three hours' run with each boiler in the morning with 1½ in. induced draught, as shown by the water-gauge. The result was briefly as follows:—

No. 1 *Boiler* (*Serve Tubes*).

Evaporation of water	32,500 lbs.
Coal burnt	34 cwt.

No. 2 *Boiler* (*Plain Tubes*).

Evaporation of water	31,000 lb.
Coal burnt	37 cwt.

This would be equal to 4·8 per cent. greater evaporation, and 14·1 per cent. more economy in fuel for No. 1 boiler.

In the afternoon a three hours' run was made with natural draught, the results being as follows:—

No. 1 *Boiler.*

Evaporation of water	18,200 lbs.
Coal burnt ...	16 cwt., 0 qr., 18 ,,

No. 2 *Boiler.*

Evaporation of water	20,100 ,,
Coal burnt	20 cwt.

This would equal 9·4 per cent. less water evaporated and 12½ per cent. economy of fuel for boiler No. 1.

These trials may be taken as simply preliminary. In fact, they were of too short duration to afford any very conclusive test.

On the following day a twelve hours' trial was made, the coal consumption in both boilers being equal, this result being obtained by regulating the draught. The following results were obtained:—

No. 1 *Boiler.*

Water evaporated in 12 hrs.	114,600 lbs.
Coal burnt ,,	11,872 ,,

No. 2 *Boiler.*

Water evaporated in 12 hrs.	103,000 lbs.
Coal burnt ,,	11,872 ,,

These results show a superiority for the Serve tube of 11·26 per cent. in evaporation on the given quantity of coal.

On October 23 a seven hours' trial was made, the draught being ¾ in. in both cases. The results were as follows:—

No. 1 *Boiler.*

Water evaporated ...	61,500 lbs.
Coal burnt ...	6,496 ,,

No. 2 *Boiler.*

Water evaporated ...	53,200 lbs.
Coal burnt ...	6,496 ,,

In this case, the Serve tube boiler showed an additional efficiency of 15·6 per cent.

On the last day of the trials, a 7¼ hours' run was made, under somewhat similar conditions to the last, when a superior efficiency of 15·86 per cent. was shown for the boiler with Serve tubes.

It will be seen by the above that a very remarkable advance has been made in the generation of steam,—the more remarkable, because so small a price has to be paid for the advantages derived. No doubt, the Serve tubes will be somewhat dearer than those of the ordinary kind, but we should imagine the extra cost would be but trifling compared to the advantages gained.

It should be stated that the French experiments were with brass tubes, whilst the tubes in the Sheffield boilers were of steel.

THE ARCHITECTURAL ASSOCIATION.*

In May, 1887, a general conference of architects was held, and a day devoted to the question of architectural education. It is interesting to note the views of the various speakers, and I think that I cannot do better than give you a few extracts from the papers that were read on the subject on that occasion. These papers, as you are aware, were published by Mr. Cates in the form of a small book, and a very useful and interesting book it is, too, as recording the views of those best able to speak on the subject. The book also contains an introductory note by Mr. Cates, in which he says, speaking of the course of instruction adopted in three institutions in America: "These systematic courses, which have counterparts in Germany and Austria, contrast forcibly with the custom of pupilage adopted in England, which ensures only some three years of office training, such as it is, and leaves the student to acquire in a haphazard manner, without due guidance or encouragement, or to neglect altogether, knowledge which is indispensable; he thus too often becomes only a sketcher or draughtsman, or a mere practical man without sound scientific knowledge;" and further on: "A thorough and systematic, scientific, practical, and artistic training, based on a sound general education, will ensure that the title of architect shall imply that its possessor may reasonably be expected to be a reliable and trustworthy adviser on all artistic and practical details . . . . "; and again he says: "The burning questions of 'Federation' and 'Registration,' which were to be considered at succeeding meetings, were less important to the well-being and prosperity of the profession than this vital one of education, which must largely influence any decision upon either of the others." We thus see that in 1887 Mr. Cates thought that the systematic course adopted in America contrasted forcibly with our English custom of pupilage, that a thorough and systematic, scientific, practical, and artistic *training* was advisable, and that the burning questions of Federation and Registration were less important than the vital one of *Education*. Note that the words training and education are used, and not cramming and examination. I think we may, therefore, look to Mr. Cates to help us either to persuade the Institute to start a course of instruction of its own or to help us with ours.

Professor Babcock in his paper insists upon the advantage of a thorough technical education for architects. His opening words are:—"May I not assume, in the presence of the educated gentlemen whom I have the honour to address, that the question of the *desirability* of educating young men specially for the profession of architecture is one that needs no discussion? May I not take it for granted that a technical education is necessary in order that architects may keep up with the times? They must have a knowledge of art, of science, and of certain mechanical trade work. How can that knowledge best be acquired? Will the young men get it most readily and thoroughly in an office, through the casual and hurried hints of his employer, and the directions given by the chief draughtsman, supplemented by such reading as he can find time for? Or in a proper school, under skilled teachers, whose sole business is to instruct?" Professor Babcock says much more to the same effect, clearly advocating systematic training, and I think we can judge for ourselves, by the work we see in the illustrated American papers, that the American architects are doing most excellent work, in spite of the disadvantages of living in a new country with no old work to study from. Although Professor Babcock advocates a complete course of *school* training before a young man enters an office, which is not quite what we are agitating for at present, yet his concluding words are of much interest, and I give them here. "A few words in regard to the practical results of the efforts which our schools are making to teach architecture. Students who graduate from the four years' course are enabled at once to get employment. Their acquirements in drawing, designing, and mathematics make them particularly useful to their employers, and they commonly get rapid promotion. Whatever can be learned in an office they are particularly well qualified to profit by. Their habits of study lead them to investigate anything that on first presentation may not be

* President's address, continued from p. 327, *ante*.

quite clear. Their education has given them a power of absorption and assimilation by which they take in and digest knowledge from every available source. They soon learn the business methods of an office, and after two or three years of service may safely venture upon the practice of the profession." What a glorious picture for a young Englishman to contemplate, and for the English architect to sigh for! Competent assistants after four years' training, and competent architects after seven. On our side I am afraid it is more like moderately competent assistants after seven years' training, and very moderately competent architects after ten or twelve.

The next paper that was read was by Mr. Robins. It is full of interest from beginning to end, and you cannot do better than read the original for yourselves, as I can only give you here a few of the more pithy remarks made by Mr. Robins. He begins: "The examination of architects has long been an established fact. Its first start was in the form of voluntary examinations. The present examination is compulsory for all who aspire to be associated with the Royal Institute of British Architects. The education of architects is by no means an established fact; it is but an inference. It is taken for granted that architects are educated men, and that the examination was all that was needed to show their title to the diploma, which it was contended was necessary to give to the public the confidence they required, and to the architect the distinction he deserved."

"But if the examination has served any good purpose, it has certainly been the means of opening our eyes to the necessity for more education, both general and technical."

And again, "the chance knowledge picked up by a pupil in an architect's office, brought there straight from an ordinary middle-class school, innocent of either art or science, with everything to learn, and nobody to teach him, is not the sort of person calculated to do honour to the Institute, though he may have just squeezed through and obtained a pass entitling him to become an Associate of the Institute."

"The standard of the Institute examination will certainly have to be raised in the near future, but it must be gradually done, and that in connexion with some well-organised scheme for imparting to architects the special knowledge they are admitted to require as professional men and practising architects seeking the Institute diploma."

Further on he says: "While we are not satisfied with the old system of apprenticeship, and think it is not now sufficient for the needs of the profession, we are not now proposing to do away with apprenticeship, but, on the contrary, to render it more effective."

The last extract I will give you from Mr. Robins' paper is as follows, and shows pretty clearly what his views as to the Institute "not being a teaching body" are,—or, at any rate, were:—"As to the day courses for pupils in offices, here again the want will create its means of satisfaction. And it is not altogether visionary to suppose that the Institute itself might organise a system of teachers and lecturers for architects' pupils."

I feel sure that the above extracts show that Mr. Robins is in favour of more systematic training for architects, and that he will help us either to persuade the Institute to supply the want, or help us to do so ourselves.

Sir Philip Magnus sent a communication to the chairman of the meeting, in which he says:—"It seems to me that there are distinct advantages in our own system (over the German); but having regard to the scientific knowledge which architects now require in the construction of all buildings, our present system, I venture to think, needs to be supplemented by special instruction in a technical school."

Mr. Arthur Hill, of Cork, next read a paper of considerable interest, beginning in the following terms:—"In all professions, special training of some kind is an acknowledged necessity. The old-fashioned system of apprenticeship, whatever advantages it possessed, is now as much out of date for professions as it is for trades."

"If any one desired to make his son a doctor, would he bind him apprentice to the old family physician; to copy prescriptions; to read such medical books as might come in his way indiscriminately; and occasionally, perhaps, to have the benefit of a little carriage-exercise in his master's brougham? Would the process be likely to produce the highly-trained body of scientific men who, as physicians and surgeons, are now to be found in every corner of the kingdom?"

Further on Mr. Hill says: "People fancy that the routine of an office and the payment of a fee will supply all the education that is needed from the time a boy leaves school until he is expected to be able to swim for himself. And, even if any one thinks otherwise, where will he find the professional training he requires?" Mr. Hill later on adds: ". . . . I believe the necessity of some system of education for architects is no longer in question; that nothing remains but to devise the way and the means. Since then (referring to a suggestion he made thirteen years before) the Royal Institute of British Architects' Examination has come into existence, and any system of education that may now be devised should be so built up that this examination may become the keystone of the whole." Mr. Hill, you observe, speaks of the Institute Examination as the key-stone of a course of education, but what is a key-stone without an arch? Something rather worse than a ship without a rudder. Having got our key-stone first, however, let us now go to work with our arch before it is altogether too late; but let us see what more Mr. Hill has to say on the subject. Continuing from my last extract, he says: "Now, examinations conducted without a properly-connected underlying system of tuition cannot be productive of any uniformity of result; a defect fatal to any broad influence of general benefit to the profession. But with a system of collegiate training not confined to the metropolis, but scattered in many parts of the kingdom, all working in harmony, preparing candidates for this examination, a very different result would be attained; for there can be no doubt young men who had spent two or three years in some college where their time was wholly devoted to study, and not frittered away in the common-place duties of a drawing-clerk, would ineffably surpass those whose reading was of the present promiscuous type, thereby tending (1) to raise the standard of the examinations and consequently of the profession at large; (2) to impress the public with the advantage of proper preliminary training . . . . Of course, any scheme of education would be doomed to failure unless it were taken up by the profession at large with the intention of making it an ultimate success; and it is upon this particular aspect of the education question that the conference may be so influential." Mr. Hill is therefore clearly in favour of a systematic training for young architects, and he further sees the advisability of any scheme of education being backed by the whole profession. On this point I quite agree with him, and it is for this reason that I think our proper course is now to memorialise the Institute, either to start an educational course of its own, or to back and help us with ours. Mr. Hill's opinions being what they are, I think there can be little doubt but that he would help in whichever of the above courses was adopted.

Professor Aitchison followed with a paper which, though somewhat lugubrious in tone, yet advocated training of a systematic nature. He says: "It seems to me that as we cannot produce men with great intellects, and with a taste for architecture, our only plan is to look at what is wanted, and to render the acquisition of the necessary knowledge as easy as possible, and, above all things, to bear in mind that, though we cannot produce a genius, we may spoil one by smothering his talent under a mass of knowledge (?) . . . . We have, therefore, not only to provide the proper instruction for the one born architect, but we have to furnish the others with something that will more or less take the place of natural powers and invention." . . . "Though 'self-taught is well taught,' real systematic instruction is, in my opinion, invaluable; it not only saves time, but it is more thorough and complete; only the teaching must not be by pedants, however learned or able, but by men who know that their teaching is towards another end, and who will render it as useful as possible to that end. . . . From a lack of preliminary knowledge pupils seem to me to leave an office at the very time the knowledge they can *only* get there is beginning to be of use to them." Professor Aitchison would therefore help us, I have no doubt.

Professor Roger Smith in his paper advocated the formation of a studio, "where regular systematic instruction day by day, at the drawing-board chiefly, could be given, and, therefore, different from and in addition to the classes at King's College or University College or the Architectural Association." The Professor's idea has been carried out by Messrs. Baggallay and Millard with considerable advantage to those attending; and in our proposed curriculum the "studio" plays a very important part. Therefore, as far as that goes, we may count on Professor Smith's support. As his paper was almost entirely confined to the suggested studio, I will only quote one more passage from the Professor's paper. He says: "No proposal for architectural education is, in the judgment of most of us,—certainly in mine,—likely to supersede pupilage as the most valuable way of fitting a youth for the practice of architecture. But something is needed that shall supplement pupilage."

Mr. Spiers followed with a paper describing the work done in the architectural school at the Royal Academy, of which, as you know, he is master. Mr. Spiers approved of the methods there adopted, and, in the course of his remarks, said: "I feel strongly, in these days of progress in education, that it is impossible to stand still, and, although the advance in architectural design, which has taken place in England during the last fifteen years, is greater than the most sanguine of us could have hoped, that very progress should give us hope, and incite us to further endeavours in the promotion of greater development." As we propose to introduce something after the manner of the Academy architectural school into our curriculum, and as Mr. Spiers says that in these days of progress we cannot stand still, he presumably would help us to move the Institute either to help us or start a system of training of its own.

Mr. Lawrence Booth, President of the Manchester Architectural Association, said: "The Institute having obtained, under Royal sanction, enlarged powers, intended to increase its usefulness, there appears to be an implied obligation that no time should be lost in applying them to some practical purpose. . . . But if the Institute would only assume its proper position as the Alma Mater of the whole profession, receiving and distributing valuable assistance without distinction or favour, it would at once become apparent that the provinces are capable of giving as well as receiving something substantial for the general good." Again: "But, above all, there would be opened out for the Institute itself such a sphere of beneficent educational administration as would enable it to justify even its regal title; and, by exhibiting to the world a body of high-minded men unselfishly seeking to qualify those of their own 'calling' as efficient and useful members of the community, it would assuage the doubts of those who, with an instinct pronouncedly national, might otherwise suspect in an application for the power of absolute control over the entry into the practice of our profession only an attempt at a selfish monopoly, or, in other words, a mere development of trade unionism. . . . Once place the education and training of students in the forefront, as one at least of the Institute's most important aims, recognised by it both as a privilege and as a responsibility, with equal earnestness, and there would be such an accession of numbers and strength as has not been either developed or even suspected to have an existence." Mr. Booth is clearly with us in our endeavours to get established a more systematic course of training for our students, and he evidently thinks the Institute is the body to do it.

The last paper read at the meeting was one by Mr. Gotch, whose opinions on the subject are, I think, well known in this Association. However, I will complete the series by giving you two extracts from Mr. Gotch's paper. Speaking of the system of pupilage, he says: "And when he" (the young man) "is articled, what does his apprenticeship do for him? In nine cases out of ten it makes him at the best an architectural practitioner; but as for being an architect, with a desire to tread the higher and nobler paths of the profession, very few offices make him that,—at least, provincial offices. . . . Our supplemental charter will give us greater scope, and it will be one great step towards improving our system of education if we establish such a series of examinations as has been sketched. It will bring the question into focus. There will yet remain the more difficult task of providing the agency by which the instruction necessary to meet these examinations is to be obtained. As a stop-gap, the course of study to be followed at existing institutions will be of great use; but I

for one shall hardly be content till the function now fulfilled on a voluntary system by the Architectural Association has devolved upon an authority recognised by the profession, and in a manner to reach not only students living in London, but those whose lot is cast in the obscurity of the provinces." We can count upon Mr. Gotch, therefore, to goad the Institute on either to recognise and assist us or to do the work of education itself.

After all these papers,—ten in number including the chairman's opening remarks,—each one advocating *education*, the meeting promptly (probably with the assistance of a little wire-pulling) passed four resolutions in favour of *examination!* It is hard to understand, but so it was. However, I think the time has come when we all agree that something more than examination is necessary to ensure the production of a creditable generation of architects. I hope I have not tired you with the numerous extracts from the papers read at the conference of 1887. I have embodied them in this address to show that neither I nor your Committee are by any means alone in advocating a proper course of training for architects; neither am I alone in thinking that the Institute should bestir itself to provide, in some shape or another, such a course of training. I also referred to them to show that, if we approach the Institute on the subject, we have very good authority on our side for so doing; and, therefore, I once more press my suggestion that we should go boldly to the Institute, as it is the representative body of the profession, and ask the Council to either establish some course of architectural training itself, or help us to amend and strengthen our methods so as to meet the urgent requirements of the case.

Mr. J. D. Sedding proposed a vote of thanks to the President for his address. That meeting was no ordinary meeting, but was epoch-marking; nor was the address which they had listened to an ordinary address,—for it was nothing less than a rallying-cry which asked for the co-operation of all the friends of the Architectural Association to come forward and help in what the President had called the crisis of its affairs. He did not think that was the right time or place for him to make any declaration upon the leading points of the President's address, but he could promise that when the proper occasion arose he would not be backward in furthering the interests of the Association as well as he could. He was heartily in accord with the proposals which had been made by their President and the Special Committee for improving the work of the Association and for giving ampler scope and permanence to its educational agencies. He fully trusted their judgment as to the best way for increasing the efficacy of the Association as an educational body. The present position of the Architectural Association afforded a vindication of the aims of its founders. To his mind, the nineteenth century, rich as it was in architectural trophies, had no more wonderful piece of building to show than that of the Architectural Association, and let them not blink the fact that that chief and only institution for the regular training of young architects represented the voluntary work of young men; and to him that was one of the noblest and saddest facts connected with its history. It was born of the thought, and sustained by the aspirations of the younger members of the profession. While the older men of the profession were busy looking after the main body of architects throughout the country it was left to the young men to provide the means of proper systematic teaching for the rising generation of architects, and right well had they carried out their task so far. But times changed, and movements grew, and development was a law of life. They could not stand still. For his part he liked a fine ideal, but he thought they were not ambitious enough in their proposed curriculum. They were seeking to systematise the knowledge of architecture as an art and as a science, and they desired to give a thorough, and systematic, practical, scientific training to the young architect. He was heartily with them in that, but he went even farther than they did. By all means let them have all they asked for,—book learning, class knowledge, examinations, &c.,—but let him of the ancient "picking-up system" plead for something to be added to their proposed curriculum, in the way of actual craft knowledge. What he wanted to insist upon was, that in any ideal scheme for an architect's academy, a youth that was instructed there should have ample means of educating himself in practical art. In these days something besides class-knowledge and book knowledge was required. If they were artists, the labour of learning would be a joy in itself, and attainment their highest reward. To him an architect was an artist first, and as many things besides as a scientific education could make him; but he was an artist first, and should know his craft before he practised it. A young man learnt *technique* enough to imitate well before he grasped the meaning of expression, and he could not help thinking that they began as a rule to design too early. If they could only wait, and work, and study, and store their souls and imagination, and train their hands, it would be a great boon to architecture. It was because he believed that as in Mediæval times, so now, the excellence of English architecture would be found to lie along the lines of interesting handicrafts, he hoped to see them find room for those classes of craft-instruction even in the proposed high curriculum of their ideal Architectural Association of the future.

Professor Roger Smith seconded the vote of thanks to the President for his address. With regard to his (the speaker's) recent remarks on the scheme of the Architectural Association in his opening lecture at the University of London, it had been said that he seemed to be too critical. He had no wish at all to suggest that, for the scheme was not only exceedingly satisfactory, but exceedingly creditable and encouraging. But every new scheme that was designed had some provisions which did not commend themselves to people outside with the same degree of force that others did; and with regard to the general proposals, it seemed to him that they were very extensive. In the Chairman's address, an idea was expressed that it would be desirable to get some help in the matter. If there was a general feeling that any help was needed beyond the support and good-will of every member of the architectural profession, he thought it might be due to the fact that the proposal as it stood was so very large and complete, and would re-cast the whole system of the Architectural Association. He wished to make the suggestion whether it might not be practical, useful, and safe to begin with part of their proposals by thoroughly establishing some of their classes for the first year; more in the second year; and more in the third; but always keeping the whole scheme in view. By all means, if it would call forth support, let them memorialise the Institute, but do not let them wait until the Institute was able to take up the matter of architectural education. He would strongly urge them to take the matter in hand and to carry it into execution themselves. Let them get as many friends as they could to help them; but he must say that if the active power in architectural instruction existed anywhere in England, it existed in that room. He cordially wished that they might obtain assistance from the Institute, or from a conference of architects or any other body that could help, but Heaven helps those who help themselves, and the certainty of success which belonged to self-help was never more necessary than in the present case.

Mr. J. M. Brydon said that it seemed to him that they had the nucleus of a great deal in the curriculum which had been foreshadowed. There was no doubt that they had within them an amount of effort and strength which was bound in the end to succeed in which they desired. It had been said that good architecture or bad architecture was a matter of opinion. It was nothing of the kind: it was a matter of knowledge, and the more strongly it was insisted on that what was good or what was bad in architecture was a matter of knowledge, the stronger would be their position in the future as architects. The idea of the proposed curriculum seemed to be an excellent one. They must not be afraid of losing their individuality, for that would come out strong enough. We dwelt too much on individuality,—at all events in England,—and lost sight of the great movements which carry on the architecture of our country. Speaking as one without responsibility, he thought the Institute ought to help them. It was all very well to say, "God helps those who help themselves," but men were born to help each other; and if a reasonable, sensible scheme was brought before the Institute, he thought it would receive the greatest consideration.

Mr. Reginald T. Blomfield said that the question of education, under certain aspects, had been thoroughly thrashed out; but one particular corner remained untouched, and that was the education of architects as artists. A certain amount of technical knowledge,—knowledge of construction, sanitation, and practice,—was indispensable to every architect; but given that, there must be added the finer feeling, the strong imagination, the executive skill of the artist pure and simple, before a man could call himself an architect. The point he would like to raise was how far, in view of the existing state of architectural education and architectural attainment, are we justified in considering ourselves artists at all? They knew Lord Grimthorpe's position, and, unfortunately, that was the position of the great majority of the British public in regard to architecture. In the case of the sculptor, in the art nearest allied to architecture, years of patient study were spent on one specific subject, the figure. The sculptor did not rest till he had mastered each subtle change of line and plane, not merely the anatomy of the muscles, but the whole relation and rhythm of the figure. He laboured with a singleness of eye and tenacity of purpose which, to an architect immersed in all sorts of studies, was amazing. Could we point to any single study which we followed out with a deliberate and sustained purpose at all on a level with that of the sculptor or the painter? He was talking of the art of architecture, and did not know of any such himself. The architectural student read standard books and measured buildings, or parts of them, and made innumerable sketches; but he seldom considered draughtsmanship as much more than the acquisition of certain tricks of drawing, instead of what it is,—the basis of all art, the power of drawing rightly what the eye sees. And architecture was studied as a style, not as an organic and very flexible language. If the fault of the last generation was deadly dulness, the danger to the present generation was amateurishness. An architect no less than a sculptor or a painter dealt with form and colour; and in his sculpture and colour decorations the architect was in the same field as the sculptor and the painter; and to place himself in proper touch with those men an architect ought to go through some of their training. He would suggest as a means of advancing in that direction that architects ought to pay much more attention to figure-drawing. The figure was the standard of proportion for all architecture, and we had no other rule of infallible and unaltering certainty which we could apply to the architecture of all ages and all countries. It might surely then be expected of an architect that he should have something more than an amateur's knowledge of the proportion of the figure; and the readiest means of obtaining that was by incessant study, first from the antique and then from the model. Power of drawing the figure was the final test of all draughtsmanship. No less important for an architect who reckoned himself an artist was the power of modelling. Modelling the figure was out of the question for any but the most gifted, but there were many kinds of architectural sculpture which, in themselves, did not require any great technical skill in modelling, provided there be behind it power of design and knowledge of the effect desired, such as foliage and those subtle gradations of abstract form in which the refined designer delighted. It was most important for the architect to control the general scale and arrangement of his sculpture, for he alone knew its relation to his building as a whole, and the readiest means of doing that was to sketch out himself in the clay the main lines and balance of the piece. He hoped we had left behind us for ever the time when architecture was one art and sculpture another. Between all the arts there must be complete interdependence if ever a great national art was to arise again among us. The first step in this direction was for the architect to place himself in touch with other artists, and in sympathy with any good workman in his craft, whatever it might be. The arts wanted shaking up together; the architect should go and work under the sculptor, and perhaps the sculptor and the painter might learn something from the architect, if they would deign to consider that poor practitioner an artist at all. They had excellent opportunities for cultivating that fellow-feeling in the Academy schools. To say nothing of their own technical improvement, it was a great thing to see how their own art was regarded by others; and if they could further that fellow-

ship between the sister arts, it would be one step forward towards the reinstatement of architecture in her true position as the oldest of them all.

Mr. Thomas Blashill referred to the increased educational advantages which existed at the present time as compared with his year of office as President of the Association, twenty-eight years ago. He thought the education of the architect was much too slow. Let them compare themselves with other professions. In the medical profession, for instance, a young man would spend five or six years in it, and at the end of that time he would be turned out, perhaps very far from being a first-rate physician, but qualified to be entrusted with responsible work such as no architect would be called upon to undertake in the whole course of his life. He would venture to suggest to those gentlemen who had the matter in hand to get up some curriculum which should turn out competent men in a few years.

Mr. A. W. Earle believed that the claims of the Association to the position of Alma Mater in educational matters was recognised by the profession generally.

The vote of thanks having been put and carried unanimously, the Chairman briefly replied, and the meeting terminated.

LECTURES ON HOMERIC GREECE.

THE subject of Mr. Leaf's second lecture on Wednesday last week was "The Comparative Dates of the Prehistoric Remains and the Homeric Poems," a question, he said, of great complexity, and difficult to treat within the space of an hour. The lecture began with a brief review of the chief prehistoric remains *in Greece Proper;* Hissarlik, it will be remembered, had been disposed of in the first lecture. As regards Tiryns, the town seems to have completely sunk in importance before the "Homeric" age, at that time obviously Argos is supreme. Mr. Leaf drew special attention to the chambers in the walls at Tiryns. Similar structures have been discovered at Carthage, and this has led Dr. Dörpfeld to the hypothesis that the Tiryns fortification walls are of Phœnician origin. Mr. Leaf admitted the possibility, but laid great stress on the fact that local tradition had always assigned a Lycian origin to the Tiryns structures.

Passing to Mycenæ, the lecturer noted that two epochs must be carefully distinguished—(1) that of the shaft-tombs; (2) that of the beehive chambers. The citadel walls, following as they do the contour of the circle which contains the shaft-tombs, must be later than these, and from their excellent masonry it appears that they are roughly contemporaneous with the beehive tombs. The pottery, known as Mycenean, has been found also in Egypt, where it can be accurately dated as of the twelfth century, B.C. It is a marked advance on that found at Hissarlik. Beehive tombs have, as is well known, been found in many other parts of Greece,—notably Menidi, Spata, and Vaphio. The art of Vaphio, as seen in the famous gold cups, is by far the most developed of this particular civilisation. Nor is this surprising, as the Achæan civilisation held its own against the incoming Dorian longer at Amyclæ than at any other stronghold. It is in the builders of the beehive tombs that we must seek, according to Mr. Leaf, for the Achaians of Homer, if anywhere. The objections urged by Helbig to this view were discussed and refuted.

Passing to literary matters, which we note only so far as they are related to archæology, Mr. Leaf stated that in the "Iliad," three stages of development could be clearly made out: (1) the original poem of the "Wrath of Achilles," mainly books 1, 11, 16, 22, and next the later additions, *i.e.* (2) songs in "praise" of the deeds of particular heroes; (3) portions composed for the sake of the poetry only. Dating these three strata with respect to the Dorian invasion,—the only possible means of dating them,—it is probable, according to the lecturer, that the first and second strata were composed *before* the Dorian invasion, the third after. On this point Mr. Leaf differs from Professor Jebb. The main result is that the "Iliad" is the work of many minds, whereas the "Odyssey" has a unity that shows its final form, at least, was the work of one mind; hence its greater "readability."

As to the relation between the remains and the poems, a general correspondence certainly exists. In matters of detailed topography this correspondence is precise in all the portions belonging to the third stage of development,—*i.e.*, the part written in Ionia,—very rough in the first and second strata, where the poet was only acquainted by hearsay.

Dr. Leaf's third lecture at the Chelsea Town Hall on Wednesday last dealt with the Homeric House. The chief literary sources of our knowledge are the descriptions of the palaces of Priam and Paris in the sixth Iliad and the complete account of the Palace of Odysseus in Odyssey 17—23. In accordance with his usual method, the lecturer took these as read, and proceeded to show the plan of the Homeric House as restored by Professor Jebb and Professor Gardner. All are agreed that the three main divisions were the Aule or courtyard, the Megaron or hall, and the Thalamos, which Dr. Leaf prefers to translate as dwelling-house rather than, as it is often taken, as Gynaikonitis, or women's apartment. In certain matters of detail, however, the lecturer showed that the plan must be corrected from the remains excavated. Thus the hearth must be placed in the middle of the megaron, not at the further end. Four columns instead of eight (as on the plan) supported the roof, and colonnades in all probability surrounded at least a portion of the aule or courtyard. The idea that the thalamos was a women's apartment from which men, save the husband and son, were strictly excluded, is wholly un-Homeric, and savours of Orientalism. In the "Odyssey," Penelope, it is true, dwelt apart in the thalamos, but there is no hint of entire seclusion,—it was simply natural that she should not go down needlessly into the megaron when it was beset by the unwelcome suitors. One of the main points for which Dr. Leaf contended was that whereas in pre-Homeric palaces, like that, *e.g.*, of Tiryns, the women's apartment was remote, in the genuine Homeric house there was easy intercommunication.

Noting briefly the main points of the much-disputed topography of the "house of Odysseus," the lecturer said that he differed from Messrs. Butcher and Lang in respect to the question of the stone and wooden thresholds. In the plan as at present accepted the two are regarded as distinct, the wooden threshold is placed at the end near the courtyard, the stone one near the thalamos. Dr. Leaf believes there were no two thresholds, the wood and the stone ones are all the same. Homer's epithets, he pointed out, are always decorative rather than descriptive. Further, if there were two thresholds, it would manifestly be improbable that the wooden one would be towards the outside, the stone one towards the thalamos.

A point of great interest is the significance of the tholos in the Homeric house. The single mention of it is in the Odyssey,—the wicked serving-maids are caught and killed between the tholos and the wall. In the prose translation of the Odyssey by Messrs. Butcher and Lang, the word is rendered "kitchen-dome." The idea of a dome is essential to a tholos: kitchen is a mere conjecture. In place of this conjecture Dr. Leaf hazarded a new and very interesting theory. Mr. Frazer, in his recent treatise on Vesta, has shown clearly that the primitive form of the house was among many people the tholos. It has already been seen that the tholos was the primitive form of a tomb, and the tomb,—the house of the dead man,—is instinctively modelled by all primitive races on the home of the living. The tholos contained the sacred fire—sacred at a time when fire was difficult to procure, and must be carefully guarded. It is remarkable that the worship of Vesta or Hestia, the primitive hearth-fire goddess, nowhere appears in Homer, and it seems possible that this cult was absorbed by the great Olympian—absorber of many a local cult, Zeus. It is noticeable that an altar of Zeus Hes-Keios—Zeus of the homestead—appears in Homer, and it is an ingenious conjecture of Dr. Leaf's that this altar may have had a circular tholos covering of some perishable material. The next lecture (Wednesday, 5th, at 5 p.m., Chelsea Town Hall) will deal with Homeric dress and armour. We propose to note, as before, such points as are novel in the treatment.

ROYAL VICTORIA HALL, WATERLOO BRIDGE-ROAD, S.E.—The following are some of the arrangements for Tuesday evening lectures at the above hall during November:—November 4, Mr. Arnold Mitchell on "Old Buildings and the Story They Tell." November 18, Mr. A. P. Laurie, "Air and Water," with experiments. The oxyhydrogen lantern will be used with these lectures.

ELECTRIC TRAMWAYS IN AMERICA.

ONE of the features most interesting to an Englishman now revisiting the United States, after an absence of a few years, is the great advance that has been made in the system of street railways, or tramways, as they are more popularly called in England. We use the word "advance" in this connexion advisedly, for there can be no two opinions as to the great superiority to the passenger of the methods of mechanical haulage, by means of electricity or cable line, now so universal, over the old system of horse traction. A paper read by Mr. F. J. Sprague supplies us with some rather striking facts in connexion with electric traction. Six years ago, he says, there were scarcely a hundred electric motors in operation in the United States for any purpose. At the time he read his paper there were fifteen thousand in use, applied to two hundred different industries. With regard to street railways, Mr. Sprague says that the storage battery system has been quite outpaced, it being necessary to have a weight of 3,500 lbs. to propel an ordinary street car. This limits the speed and the grade of line upon which the cars can be worked. The expense, too, is about double that of the overhead conductor system, although less than that of horse traction. The conduit system, in which the electrical conductor is placed in a trough beneath the roadway, has also been tried, and found to be inferior to the overhead wire, only a very short section in Allegheny city remaining in use out of the many miles laid down in various towns of the States. It is, as has been intimated, the overhead conductor system that has made the greatest progress. There are, or, rather, were when Mr. Sprague read his paper, 130 towns or cities in the United States with one or more electric railways in operation or under contract, comprising about 1,500 miles of track. They were equipped with 1,700 motor cars, and 3,000 motors. The roads then in operation were making 100,000 miles per day, a mileage which, if arrangements then made have been duly carried out, has since been doubled. Grades of 12½ to 14 per cent. have been ascended by a motor car pulling a second car. In crowded cities the speed has increased 50 per cent., and in the suburbs twenty miles an hour are made.

Electric traction is, however, moving with such rapid strides in the United States, and, as Mr. Sprague's paper has been read some time, no doubt the figures would prove much more startling were statistics available to bring them up to date; for instance, we learn by a recent American contemporary that the Westinghouse-Pullman Company has just been formed, and will start by erecting works to the value of 500,000 dols. for the manufacture of electric street cars.

The chief objection to the overhead system is the inconvenience of having standards erected at intervals along the street to carry the wire. In a country that tolerates the elevated railroad this is but a trifle. Whether English local authorities can be educated to allow such an obstruction remains to be proved. An electromotive force of 500 volts. is used, and this, although unpleasant to the human frame, is not in itself dangerous to life; besides which the wire is placed far out of reach. Another objection is the disturbance caused to telephones through induction, but this will not apply for long if we may credit what Mr. Preece has recently said, that all telephones will soon have metallic returns; a step which we may remark in passing will render the telephone a real convenience, and not, as it was recently described, "an invention of the Evil-one, devised to propagate the use of profane language."

OVERFLOW OF WATER-TANK AT THE FOREIGN OFFICE.—On Sunday morning the overflowing of the water-tank which surmounts the tower of the building, facing St. James's Park, caused considerable commotion. Some weeks ago plumbers were engaged to repair the tank, and fixed in it some new ball floats, which, it appears, were placed so that they could not rise and fall freely. This, it seems, caused the overflow, and the water entered almost every room in the building. A messenger was despatched to the Office of Works, where a plumber is always on duty. The latter succeeded in turning off the water, when the flow soon ceased, but not until great damage had been caused to papers and furniture. The Tower Room was flooded, as was also another apartment between it and Lord Salisbury's room.

Illustrations.

KÖNIGSTRASSE, NÜRNBERG.

THOUGH Nürnberg has earned the title of the "Birmingham of Germany," its ancient walls still enclose a city almost without a rival for Mediæval character and picturesqueness.

The electric light and steam tramways that it now enjoys, as well as the enormous railway-carriage manufacturing industry, have refrained themselves, as becomes such creatures of the nineteenth century, from altering to any serious extent the streets and buildings in which Albert Dürer and his friends lived and moved. The principal street of the St. Lawrence side of the town is represented in the sketch, and is called the Königstrasse. The proud free city of the Middle Ages must have had some other name for its high street than this in its golden days, before it was handed over to the Bavarians by Napoleon in 1806.

The Church of St. Lawrence stands at a bend of the street, with its twin "gridiron" belfry stages. Opposite its western end is the Nassauer House, on the left of the picture the fine Halle Gebäude, and on the right, in suggestive contrast, a large modern drapery establishment. The general character of the streets of Nürnberg, its wonderful dormers and quaint oriels, is well illustrated by the Königstrasse.

A. BERESFORD PITE.

SCULPTURE, SOLDIERS' AND SAILORS' MONUMENT, CLEVELAND, OHIO.

THIS is a monument to soldiers and sailors of Cleveland who fell in the great American war between the North and South, now ancient history in a sense, but the memory of which still has the greatest interest for all who can appreciate the great issue of the struggle, and the amount of military genius and heroism which it called forth.

The monument was designed, and the sculpture modelled, by Mr. Levi T. Scofield, who also took an active part in the war, first as soldier and then as officer, and, in modelling the four sculpture subjects which stand on pedestals opposite the four faces of the monument, was to a great extent illustrating scenes in which he had himself taken part.

For the architectural design of the monument, of which we give a small sketch (mainly to indicate how the sculpture groups illustrated are connected with it), we fear we cannot express much admiration, and perhaps the sculpture will hardly pass the ordeal of criticism from the London or Paris studio point of view; but we think our readers will agree that there is a considerable interest in this attempt to make sculpture subservient to the representation of actual and realistic fact from the battle-field, and by an eye-witness of the scenes represented.

The groups are in bronze, but the illustrations were photographed from the plaster models in the artist's studio, under the disadvantage of restricted space which did not allow of an advantageous position for the camera, and hence a certain degree of unavoidable distortion in some of the figures.

The Artillery group "At Short Range" represents an actual incident in the battle field, when the man who had just withdrawn the rammer from the gun was shot in the heart and staggered back with his left arm over the gun for support and his right still grasping the rammer. The Infantry service is represented by "Colour Guard," and also records an actual incident in the war, which we give in the sculptor's own words:—

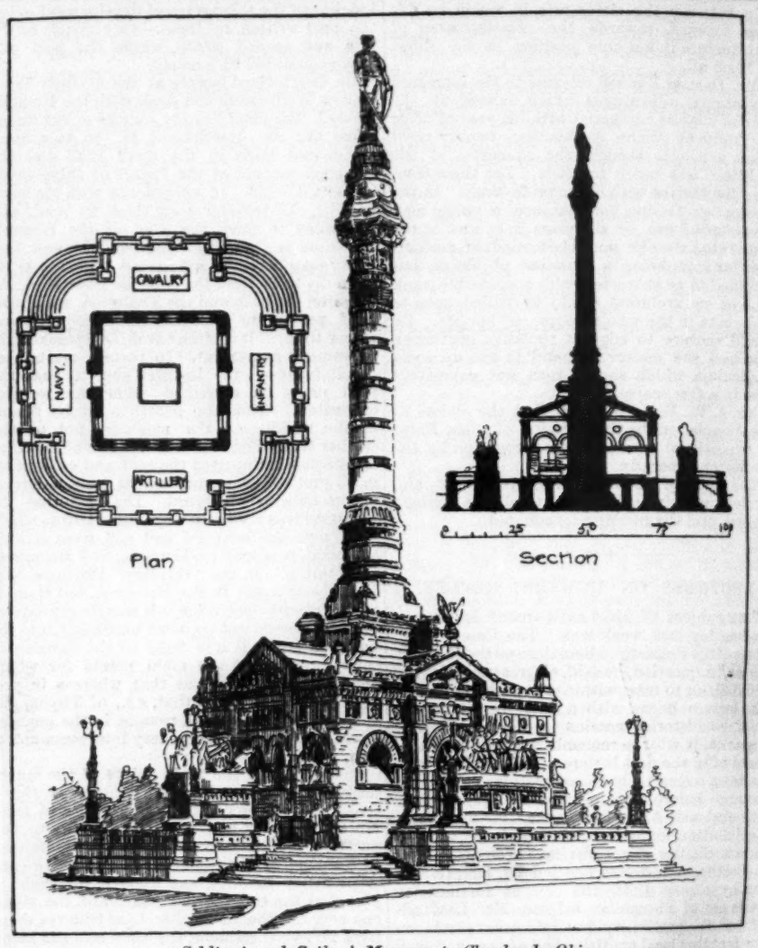
"At the battle of Resaca, the 103rd Ohio Infantry, charging in line, had carried the two outer lines of the enemy, and had been ordered to lie down in the abattis for a short rest, preparatory to the final charge over the main line. The brave colour-sergeant and the eight corporals forming the guard would not lie down, and were all killed or wounded. The sergeant, Martin Striebler, was of gigantic stature, and while waving the flag over the line, was shot with a bullet through the centre of his forehead, and had from twenty to thirty other wounds on his body. The tattered colours are now in the flag-room at the Columbus capital, and after twenty-seven years still retain the blood stains of the dead hero."

The Cavalry group, "The Advance Guard," represents a detachment that has struck the line of the enemy; we give the author's description again:—

"A trooper is still astride his horse that has fallen with a bad wound. A venturesome Confederate soldier has noticed his predicament, and has made a rush for the guidon, but the cavalryman has whipped out his revolver, has given 'Johnny Reb' one in the face, and is prepared for another shot. A Confederate officer has seized the rebel flag from the fallen bearer, and is cheering his men to the assault. A dismounted trooper in front, on one knee, is covering his man with his carbine. The bugler has been sent forward from the reserve by his officer to see how matters were progressing at the front. Finding them hard pressed and stubbornly trying to hold their ground, he has dismounted, and is sending back a bugle-call for assistance. The Confederate soldiers were introduced in this historical group to show to posterity what they and their flag were like."

The Navy group, "Mortar Practice," represents a scene near Island No. 10 on the Mississippi river, where an officer and five men are landing a mortar preparatory to shelling the intrenchments.

The statuary, as already observed, will be of cast bronze, the building and shaft of dark granite. The total height, to the top of the crowning figure of "Liberty," is 125 ft.; the base of the whole monument is 100 ft. square and the building 40 ft. square; the pedestals on which the groups rest are 19 by 7 ft. The figures are about 8 ft. in height. The interior of the building will be marble, and will have coloured marble tablets on which will be engraved the names of the soldiers that were sent to the war of the rebellion from Cleveland, 10,000 in number. The total cost of the monument will be 100,000 dollars.



Soldiers' and Sailors' Monument, Cleveland, Ohio.

DESIGN FOR A PUBLIC LIBRARY.

THIS design for a public library for a small country town, by Mr. W. Pywell, gained its author the Architectural Association medal for this year. We give the perspective view and the ground and first floor plans.

The following was the definition of the subject which was given to competitors:—"A Public Library for a County Town.—On a corner site, the principal frontage measuring 100 ft., with a depth of 50 ft. down side street. Accommodation required:—Storage for books, porter's residence, and heating-chamber, &c., in basement; lending library, with space for 30,000 volumes, and a news-room, with small room off same for magazines, lavatories, &c., on ground-floor; reading-room, with accommodation for 20,000 volumes; small room off reading-room for librarian, and a committee-room on the first-floor. On the second floor should be placed residential chambers for the librarian and storage for books."

HOUSE AT WIMBLEDON.

THIS house, designed by Mr. J. Ransome, stands on a corner site, facing the Malcolm and Worple-roads, at Wimbledon. The roof and walls (to the level of the first floor) of this house are hung with tiles taken off an old barn, which has been lately pulled down.

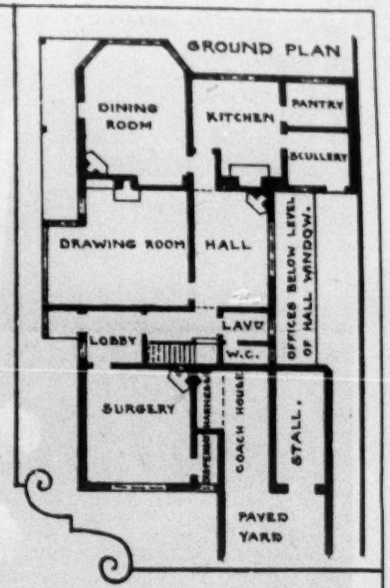
Owing to the age of these tiles the building has escaped the glaring red colour which is the chief defect in all new tile-hung structures. Below the level of the first floor the walls are of red brickwork, the mullions and transoms of the windows being in wood painted white. The dining-room and drawing-room open on to a verandah with a southern aspect. The surgery and dispensary are approached only from the lobby and have no communication with the rest of the house.

The large angle window, on the first floor, lights the morning-room, which is off the landing half-way up the staircase. Mr. Ernest Knight, of Morden, was the contractor.

HOUSE AT SUTTON.

THIS house has been erected at Sutton, Surrey. The walls up to the first floor are hollow, and are faced with red bricks; the walls above and the roofs throughout are hung with Broseley tiles. The external woodwork has been stained dark brown, oiled and rubbed down; the hall being treated in the same manner. The casements throughout are of

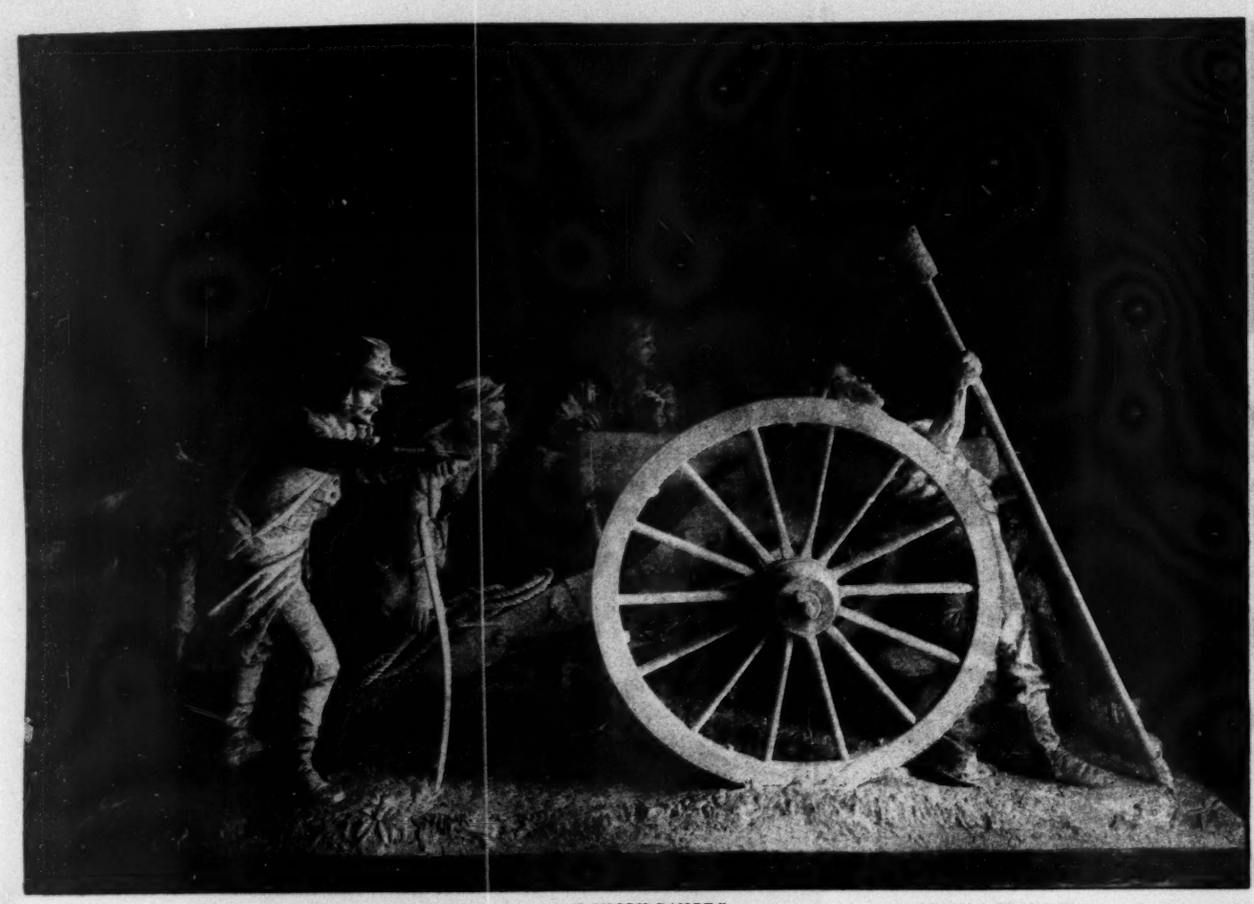
HOUSE AT WIMBLEDON, for
W. H. FROME YOUNG ESQ^RE
JAMES RANSOME ARCHITECT



VIEW FACING SOUTH.

PHOTO-LITHO. DAWBARN & CO. 62 MARTIN LANE, CANNON ST. LONDON, E.C.

PHOTOCOPIED BY THE ARCHIVES OF ANTHROPOLOGY



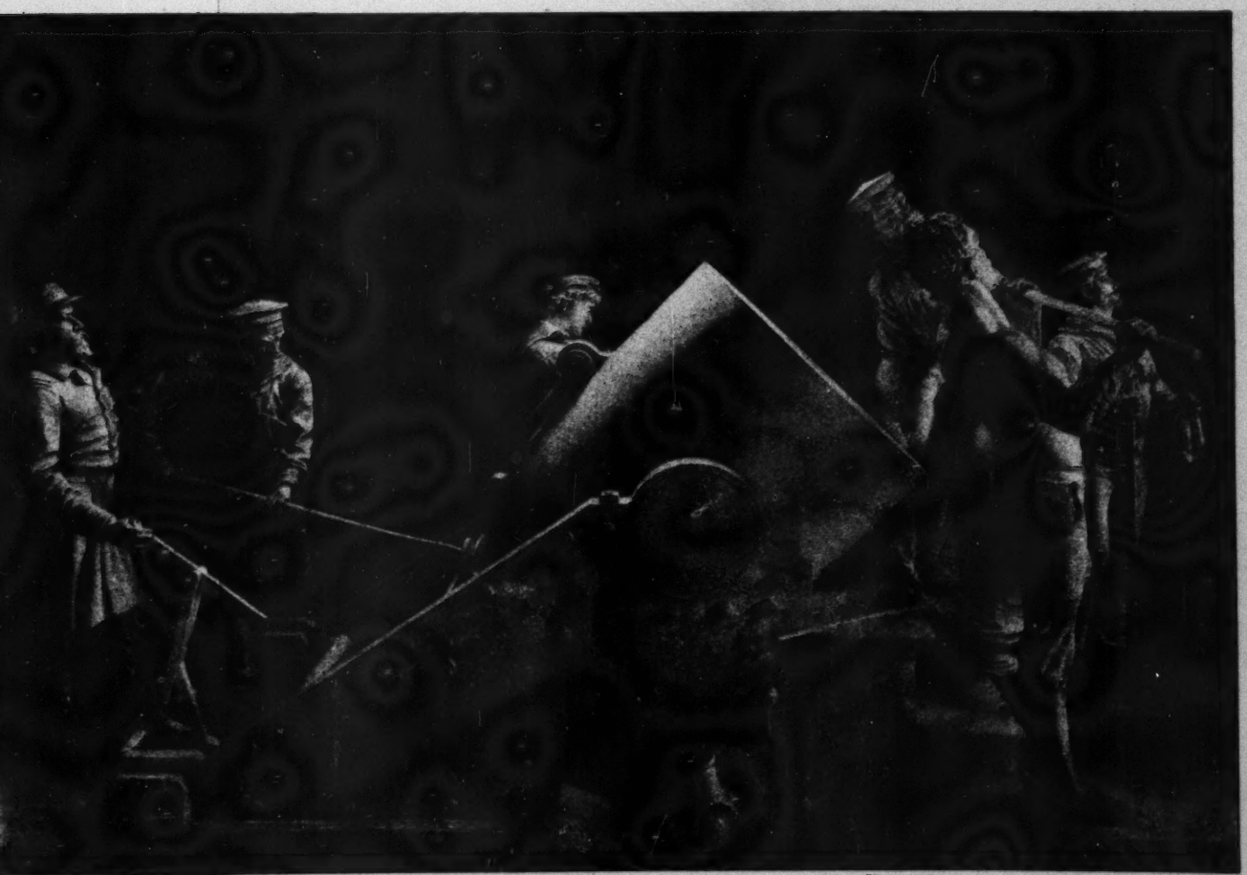
"AT SHORT RANGE."

"ADVANCE GUARD."

SCULPTURE FROM THE SOLDIERS AND SAILORS

MR. L. T. SCOFIELD, ARCHITECT

"COLOUR GUARD."

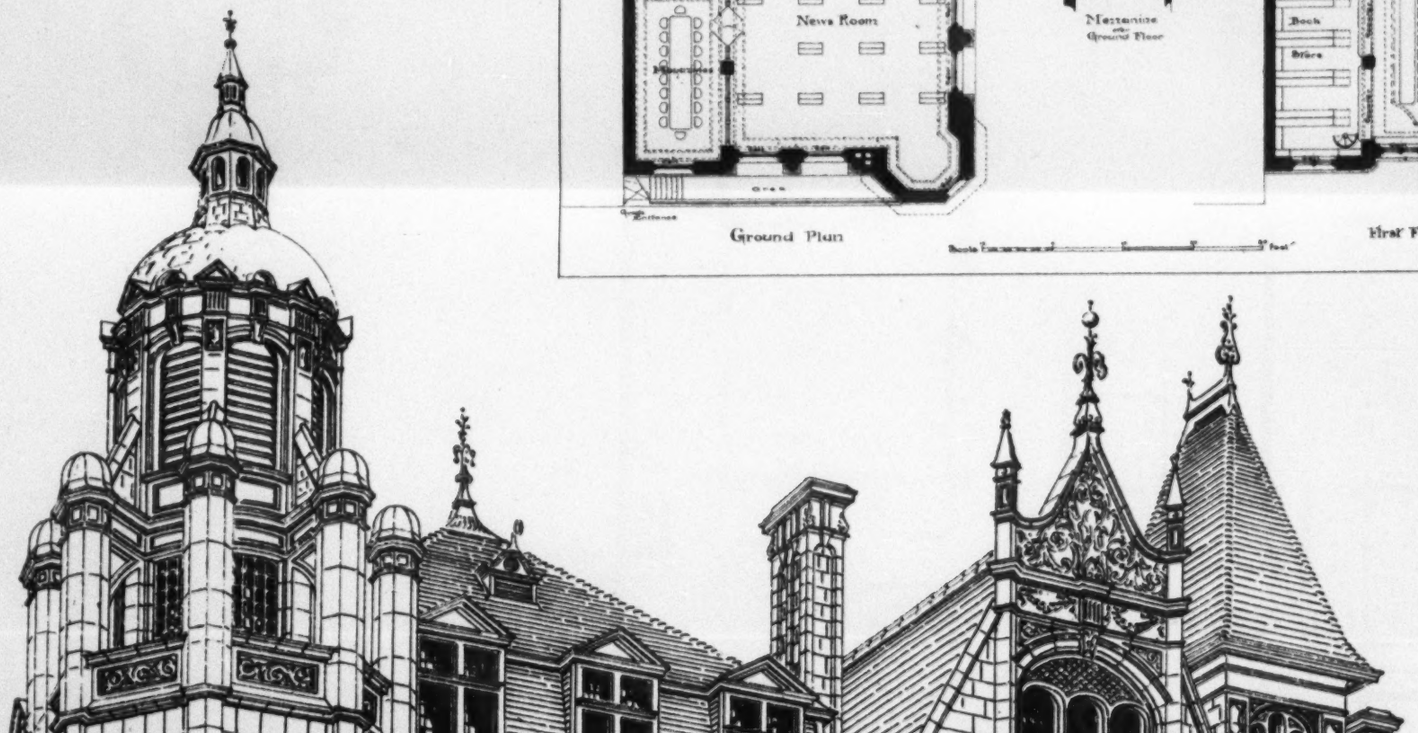


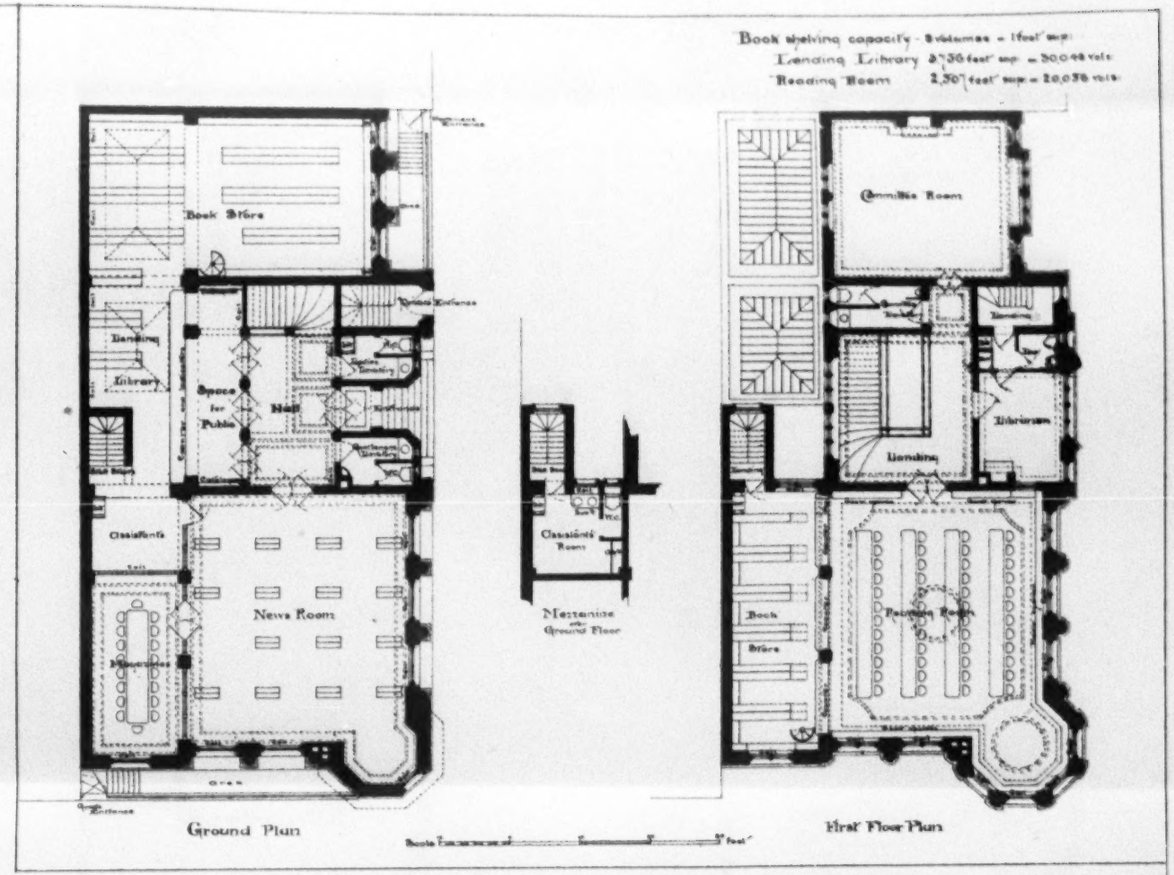
"MORTAR PRACTICE."

"INK-PHOTO," SPRAGUE & Co., 82, MARTINS LANE, CANNON ST, LONDON, E.C.

AILORS MONUMENT, CLEVELAND, OHIO.

CHITECT AND SCULPTOR.




Book shelving capacity - 9 volumes = 1 foot run
Lending Library 5,736 feet run = 30,048 vols
Reading Room 2,307 feet run = 20,076 vols
Book Store
Lending Library
Space for Public
Hall
Classified
News Room
Mezzanine
Ground Floor
Committee Room
Librarian
Lending
Book Store
Ground Plan
First Floor Plan

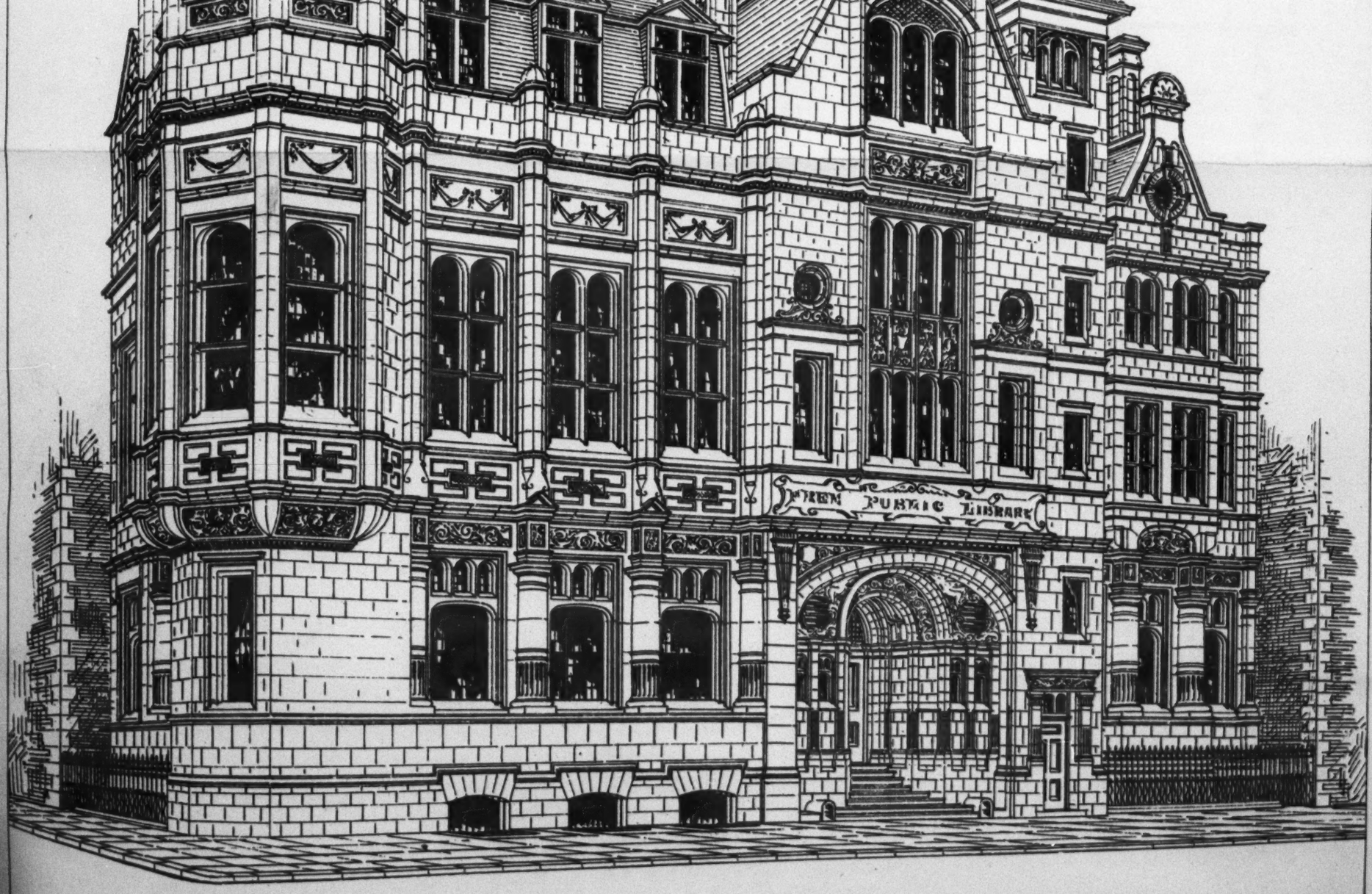


PHOTO-LITHO. SPRAGUE & Co. 82. MARTINS LANE CANNON ST. LONDON E.C.

DESIGN FOR A PUBLIC LIBRARY FOR A COUNTRY TOWN.—By Mr. W. Pywell.

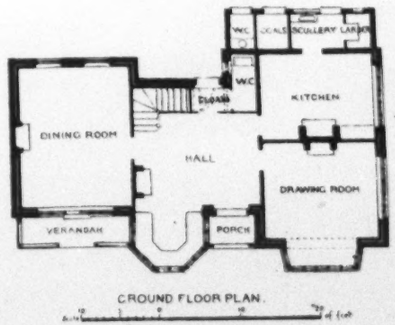
Architectural Association Medal, 1890.

"THE PHOTO," SPRAGUE & CO., 22, MARTIN'S LANE, CANNON ST., LONDON, E.C.

THE KONIGSTRASSE, NÜRNBERG.—From a drawing by Mr. A. Beresford Pite, A.R.I.B.A.

HOUSE AT SUTTON SURREY

MR R A BRIGGS A R I B A Architect



GROUND FLOOR PLAN.

PHOTO-LITHO SPRAGUE & CO. 82, MARTINS LANE, CANNON ST. LONDON, E.C.

wrought iron, with ornamental plates, and are filled in with leaded lights. The total cost of the house was under 700*l.*

The illustration is from a drawing by the architect, Mr. R. A. Briggs, A.R.I.B.A., which was hung in the last Royal Academy Exhibition.

THE ART CONGRESS AT BIRMINGHAM.

THE prospectus of the proceedings at the Art Congress at Birmingham next week has only just been finally arranged in all its details. The following is the list as it now stands; the sections referred to by letters of the alphabet are as follows:—

A = Painting.
B = Sculpture.
C = Architecture.
D = Applied Arts.
E = Museums and National and Municipal Encouragement of Art.

Order of Proceedings.

Tuesday, November 4. — 10 am., Meeting of Council, No. 1 Committee Room, Council House. 11 am., Mr. P. H. Rathbone, Presidential Address in Section E; Mr. J. Thackray Bunce on "Encouragement of Art by Municipalities;" Mr. T. Stirling Lee on "Municipalities in their relation to Art Schools." 2 p.m., Combined Meeting of Sections B and C; Mr. Roscoe Mullins on "Sculpture as Internal Decoration;" Mr. Ralph Nevill on "The Study of Local Architecture, especially for Schools of Art;" Combined Meeting of Sections A and D; Mr. Selwyn Image on "Colour in relation to Internal Decoration." 8 p.m., Inaugural Address by the President, Mr. J. E. Hodgson, R.A., at the Midland Institute.

Wednesday, November 5.—11 a.m., Mr. T. G. Jackson, F.S.A., Presidential Address in Section C; Mr. R. T. Blomfield, on "Architect and Artist;" Mr. H. H. Statham, on "Ancient Buildings and Modern Architects." 2 p.m., Section A; Papers by Mr. John Brett, A.R.A., on "Education in Art;" Mr. Stanhope Forbes (not fixed); and Mr. W. J. Wainwright, A.R.W.S., on "Some remarks on the English School of Water Colour Painting." 2 p.m., Combined Meeting of Sections B, C, D, E; Mr. Heywood Sumner on "Advertisements;" Mr. Bidlake on "Architectural Drawing;" Mr. T. R. Ablett on "The Drawing Society." 8 p.m., Reception by the Mayor (Alderman Clayton) at the Council House.

Thursday, November 6.—11 a.m., Mr. A. H. Mackmurdo, Presidential Address in Section D; and Mr. Alfred Gilbert, A.R.A., on "Metalwork." 2 p.m. Mr. Henry Holiday, on "The Figure in Design." Mr. J. W. Tonks, on "Art as applied to Jewellery and Personal Ornament." 2 p.m., Combined Meeting of Sections A, B, C, E; Mr. James Orrock, R.I., on "A Gallery of British Art." 4 p.m., Reception by Royal Birmingham Society of Artists, New-street.

Friday, November 7.—11 a.m., Mr. G. Simonds, Presidential Address in Section B; Mr. E. Onslow Ford, A.R.A., on "The Modern Education of Sculptors;" Mr. B. Creswick (Modelling Master Birmingham Municipal School of Art), on "The Relation of Sculpture to Architecture." 2 p.m., Section E; Mr. William Kenrick, M.P., on "Technical Education as applied to Art Industry;" Mr. C. R. Ashbee, "How can we foster Art at our Polytechnics?" 2 p.m., Combined Meeting of Sections A, B, C, D; Mr. Aston Webb, on "Architecture and Education in the Future;" Mr. F. G. Jackson (Master of Design Birmingham Municipal School of Art), on "Art Education in relation to Industry." 8 p.m., Reception by Local Committee at Edgbaston Assembly Rooms.

Saturday, November 8.—11 a.m., Mr. W. B. Richmond, A.R.A., President of Section A, followed by the General Meeting.

There will be three Evening Lectures for Working Men, at 8 p.m., on Wednesday, Thursday, and Friday evenings, in the Large Lecture Theatre of the Midland Institute. They will be by:—Mr. Starkie Gardner, on "Metalwork;" Mr. J. E. Hodgson, R.A., on "Art Books;" and Mr. Henry Holiday on "Glass."

The reception room will be in the Town-hall. The sections will meet in the large lecture theatre at the Midland Institute, and in the Council-chamber at the Council House; but we observe that the card of meetings sent out does not state in which of these two rooms each set of papers will be read; this is not very business-like, and the omission is likely to cause inconvenience to visitors.

Various local manufactures will be open during the week to members of the Congress, including those of the Birmingham Small Arms and Metal Co.; Messrs. Elkington's Electroplate Manufactory; Messrs. Hardman's Stained Glass Works; Messrs. Hart Son & Peard's "Art" Metal Works; Mr. T. Moore's Die Sinking Medal and Seal Engraving Works; Messrs. Osler's Glass-cutting rooms; Messrs. Webley & Sons' gun and rifle manufacturing; Messrs. Winfields, where tube drawing and metal rolling is combined with stained-glass work. But the great show of the year, among the accompaniments to the Congress, is the collection of the works of David Cox, got together with great pains by Mr. Whitworth Wallis, the energetic curator of the Art Museum, and which is such a representative collection of the great water-colour artist's work as probably will not be seen in one room again.

THE LONDON COUNTY COUNCIL.

THE usual weekly meeting of the London County Council took place on Tuesday, at Spring-gardens, Sir John Lubbock, M.P., in the chair.

Improvements at Bethnal-green.—Nearly the whole time of the Council was devoted to the consideration of a report of the Housing of the Working Classes Committee or a scheme for the improvement of a certain part of Bethnal-green. The following is the greater part of the report:—

"On July 19 last the Medical Officer of Health for Bethnal-green made an official representation to the Council under the Artisans' and Labourers' Dwellings Improvement Act, 1875 (better known as Cross's Act), relating to an unhealthy area in that district, and on September 16 the Medical Officer for Shoreditch represented a small area in that parish immediately adjoining the Bethnal-green area. Since the representation relative to Bethnal-green was made, Cross's Act has been repealed, and your Committee have obtained a fresh representation under part 1 of the Housing of the Working-Classes Act, 1890, which is practically identical with Cross's Act, except that some of the compensation clauses are a little improved. The representations were referred to the Medical Officer of the Council for report, and his report substantiates the statements as to the condition of the area contained in them. The representations from Bethnal-green and Shoreditch are dealt with as one in the report, as the officers of the Council advise that the recoupment and opening-up of the area in Bethnal-green are materially assisted by including the small neighbouring area in Shoreditch. Your Committee have at various times personally inspected the area, and were especially struck by the narrowness of the streets, the widest measuring only 28 ft. There is also a great difference of level between the streets and the floors of the houses, in some cases as much as 18 in., and the appearance of the inhabitants indicates to your Committee a low standard of vitality. In many cases there are no back-yards. The total area is about fifteen acres in extent, and is bounded on the north by Virginia-road and St. Leonard's churchyard, on the west by Boundary-street and High-street, on the south by Church-street, and on the east by Mount-street. The streets are twenty in number. The average population per room is about 2¼, and 107 rooms have five or more inhabitants each. There are many small courts, of a very bad class. The area comprises 730 houses, of which 652 are occupied, wholly or partly, by persons of the labouring classes; the remaining 78 houses consist of 12 public-houses and beer-shops, 21 shops and factories, 2 registered lodging-houses (153 beds); and 43 empty houses. The population, exclusive of those in lodging-houses, is 5,566—viz., 3,370 adults and 2,196 children, who occupy 2,545 rooms subdivided as follows:—2,118 persons occupying 752 single-room tenements; 2,265 persons occupying 506 two-room tenements; 1,183 persons occupying 211 tenements of 3 or more rooms (781 rooms). Including those in the lodging-houses, the total number of persons of the labouring classes displaced will be 5,719. The above facts effectually remove any doubts as to the metropolitan importance of the scheme. The houses (mostly two-story dwellings) are generally small, old, and dilapidated. In many of them the ground-floor is situated below the level of the street pavement, which renders the lower rooms very damp. The floors themselves lie on the earth, and there are no damp-courses. On the eastern side of the area are many ill-ventilated courts and narrow streets. The Medical Officer for Bethnal-green reports that 'a low condition of health prevails in the area, and that this is due to the bad condition of the houses, and bad arrangement of the streets and courts.' He further says that 'the lighting and ventilation of many of the houses are defective, and that a number of them are insufficiently provided with proper sanitary conveniences, inasmuch as the only access to the closet in the yard is through a dark, badly-ventilated cellar.' The opinion which has been formed by your Committee as to the condition of this area is fully borne out by the statistical evidence which has been adduced concerning it. The following striking figures are extracted from a report furnished by the medical officer of Bethnal-green. The deaths registered and relating to that part of the area situated in Bethnal-green, being nineteen-twentieths of the total area, give the following rates of mortality. Those in Bethnal-green as a whole are also stated for the purposes of comparison—

	Bethnal-green (1886-88). Per 1,000.	Represented area (1886-88). Per 1,000.	Represented area (1889 only). Per 1,000.
General mortality ..	22·8 ..	40·0 ..	40·13
Deaths from zymotic diseases	3·7 ..	7·9 ..	10·71
Deaths from tubercular, &c. diseases.	3·9 ..	8·5 ..	7·26

It is therefore evident that about twice as many persons die in this area each year as would die if the mortality were the same as in Bethnal-green as a whole. Your committee have made further inquiry as to the rate of infant mortality in the area as affording yet more precise evidence, and find that while in the four years 1886-89 in Bethnal-green as a whole an average of 159 deaths occurred annually among children under one year of age to every 1,000 births, in this particular part of Bethnal-green the average annual number of deaths of such children was during that period 252 to every 1,000 births. It will be seen that, whether judged by the general death-rate or by death-rates from those classes of diseases which are especially associated with unwholesome conditions, this area is pre-eminently one that demands a comprehensive scheme. The density of the population alone shows that some radical re-arrangement is necessary, as in this area, consisting almost entirely of two-story houses, there are living 373 persons per acre, whereas over Bethnal-green generally, by the last census, the population is 168 per acre. The Valuer's estimate of the gross cost of the scheme is 371,000*l.*, from which must be deducted the estimated recoupment of 106,000*l.* There must be added the Engineer's estimate of the cost of the new and widened streets, a sum of 35,000*l.*, bringing the total estimated net cost of the scheme to 300,000*l.*, which, reckoning on a loan for 60 years, becomes a burden to the ratepayers (including interest) of 14,000*l.* for the first year, a charge which will diminish each subsequent year. The great cost of the scheme has been carefully considered by your Committee, but they are of opinion that the large saving of life which may be expected as the result of the scheme more than compensates for the cost. Your Committee, in their report presented on April 22 last, dealt with the re-housing of people displaced under such a scheme as this, and expressed the opinion that they should, if possible, have some means of re-housing, however temporarily, some of those displaced. Your Committee have taken steps to ascertain what vacant land, if any, exists in the vicinity, and hope to embody the information obtained in a later report. It is not, however, the intention of the Committee, if the scheme is approved by the Council, to clear the whole area at once, but rather to deal with it in sections, and thus avoid the necessity of disturbing more than a limited number at a time. Your Committee draw the attention of the Council to the fact that October 28 is the latest day upon which the area can be dealt with under a scheme without a year's delay, as Part I. of the Act of 1890 prescribes that advertisements must be published in three consecutive weeks in the month of November. Your Committee submit the following formal recommendations:—

(*a*) That, subject to the necessary estimate being submitted to the Council by the Finance Committee, as required by the statute, the necessary resolution under section 4 of the Housing of the Working Classes Act, 1890, be passed by the Council, and that the seal of the Council be affixed thereto.

(*b*) That the draft scheme submitted by the Committee for the improvement of the area referred to in the foregoing resolution, be approved, and that it be referred to the Committee to complete the scheme, and to take all the necessary steps for depositing and obtaining confirmation thereof."

Lord Compton, M.P. (Chairman of the Committee), in introducing the report, said that the scheme was the first big scheme brought before the Council by the Housing of the Working Classes Committee. The local authority had stated their distinct opinion that the whole area was unfit for habitation; and they had also informed the Council that in their opinion the area should not be dealt with except as a whole, that it was too large to be dealt with piecemeal, and that it should be considered a metropolitan and not a local improvement. The death-rate was very high, and in consequence of the insanitary condition of the whole area, two people had died, as compared with one who died in other parts of Bethnal-green. The Committee had very carefully inquired into the matter, and had come to a unanimous conclusion that the whole area was in a very insanitary condition; but as to the manner in which the area should be dealt with, there was a difference of opinion even on the Committee. The eastern part of the area was rather more insanitary than the western part; but the death-rate in the two parts was about the same. The matter could be dealt with under Cross's Act or Torrens's Act, or under both partly. A strong

opinion prevailed that the area should be dealt with as a whole under Part 1 of the Act, and as a Metropolitan improvement. They did not propose that the improvement should be carried out immediately by pulling down all the houses, for that would cause a great deal of misery; but that they should gradually put the whole area into a better state. With regard to the cost, he frankly admitted that 300,000*l.* was a large sum to ask for; but the matter was one of human life. He hoped the Council would act in no niggardly spirit. If they dealt with the area in small sections, they would be merely tinkering with the matter, and the scheme would have to be gone into at a subsequent date. An extraordinary amount of immorality also existed in this area, which was the inevitable result of its insanitary character. He concluded by asking that they might deal with the matter as a whole, and shed a little more purity into that part of London.

Mr. Watney moved as an amendment:—"That it be referred back to the Committee to report to the Council whether, under the Act of last session, the Council is not able to make the owners put their houses in a satisfactory condition without charge to the ratepayers." If the report was adopted, he said, the Council would be adopting a precedent which would involve them in great expenditure.

Mr. Maule seconded the amendment. If they agreed to the proposed expenditure, they could not complete the work throughout London under a cost of three hundred millions sterling.

Mr. Austin supported the recommendation of the Committee. The death-rate in the area referred to was 40 in the 1,000, or more than double the ordinary rate.

Mr. Beachcroft said he believed it was admitted on all hands that this was an unhealthy area. He thought that part of the area, the western, could be dealt with under Part 2., but not the whole.

Mr. Hutton, who opposed the scheme, said he thought the Council should set the local authorities in motion, and see that the buildings were put in a proper condition.

Dr. Longstaffe gave a number of statistics to show the terribly insanitary condition of the area.

Colonel Edis thought they should make the local authorities do their duty. The scheme offered a premium to those who kept unhealthy dwellings.

Lord Lingen said there were many points requiring consideration. He was entirely in favour of doing everything that was reasonable, prudent, and practicable in carrying forward the movement for the better housing of the working-classes. The amendment, however, for which he intended to vote, would give time to consider the proposals made by the Committee.

Mr. Boulnois, M.P., moved the adjournment of the debate.

Lord Compton opposed this.

On a division the adjournment was carried, and later on the Chairman said he had received a requisition to call a special meeting on Monday to consider the scheme.

New Fire Brigade Station for Wandsworth.—The Fire Brigade Committee recommended, and the Council agreed to accept, a tender of Messrs. Stimpson & Co. to erect, at a cost of 7,980*l.*, a new station at Wandsworth; and also that power be taken for the erection of a station on ground adjacent to Clapham Common.

The Council soon after adjourned.

Architectural Association Lyric Club.—The opening concert of this club was held at the headquarters, Mona Hotel, Covent-garden, on Tuesday, October 28. A good programme was arranged by Mr. J. Douglas Scott, and conducted under the President, Mr. W. Burrell. The following members and friends contributed towards the entertainment:—Messrs. J. D. Scott, Pywell, Lidstone (violin), W. E. Johnson, S. B. Garcia, F. H. Collins, and C. D. Imhof (who again appears as accompanist). Any member of the Architectural Association wishing to join the club should write to the hon. secs., Messrs. W. Henry White and Theo. Moore.

Removals.—We are asked to state that Messrs. C. S. Worssam & Co., wood-working machinery manufacturers, have decided to remove from Queen Victoria-street to the vicinity of their works, at 172, Burrage-road, Plumstead, S.E.—We are also asked to notify the removal of the City offices of Messrs. Colls & Sons, builders, from Moorgate-street to No. 5, Coleman-street.

ARCHITECTURAL SOCIETIES.

Glasgow Architectural Association.—The second lecture of the present session was given on the 21st ult. by Mr. Wm. Paton Buchan, on "The Ventilation of Buildings," in the Philosophical Society's Rooms, Bath-street, Glasgow, the President (Mr. Wm. J. Anderson) in the chair. Beginning with the chemical composition of air, and the quantity absolutely necessary for life and desirable for health, the lecturer compared these with tables of analyses made of the atmosphere found in theatres, churches, schools, and dwellings. Some experiments were made with a lighted candle to show the vitiation of air caused by our necessary illuminants. The lecturer then passed to a criticism of the practical methods that have been, and are, adopted to secure at once the admission of fresh and the extraction of foul air,—a problem that, simple as it may appear, was beset with difficulty if draught and the loss of all heat was to be avoided. Mechanical power was now more commonly employed than hitherto. For churches, however, automatic ventilation was, of course, much cheaper, and might be quite effectual. By diagrams the principal patent systems were illustrated, and their merits discussed. At the conclusion of the lecture a hearty vote of thanks was passed to Mr. Buchan.

Correspondence.

To the Editor of The Builder.

CEMENT TESTS.

Sir,—I have frequently noticed in your valuable paper references to the Prussian standard rules on Portland cement (see p. 323, October 25, 1890), and as I have myself encountered great difficulty in finding out what these rules are, I have thought it might be of some interest to your readers to have a translation of them. The translation is made from an official copy supplied to me from Berlin. This copy gives at the same time instructions and explanations under each head, which I have not translated, so as to give the rules in a short and handy form, but if any of your readers should care to have them, I shall be glad to supply this information.

H. Alfred Roechling.

23, Highfield-street, Leicester.
October 24, 1890.

Prussian Standard Rules for the Uniform Delivery and Testing of Portland Cement. Circular of the 28th day of July, 1887.

Definition of Portland Cement.—Portland cement is a product obtained by burning an intimate admixture of substances containing, as chief ingredients, lime and clay, to clinkers, and afterwards grinding and pulverising the same.

1. *Packing and Weight.*—As a rule, Portland cement is to be packed in standard casks of 180 kilogrammes (= 3·54 cwt.) gross weight, and about 170 kilogrammes (= 3·34 cwt.) net weight, and also in half standard casks of 90 kilogrammes (= 1·77 cwt.) gross weight, and about 83 kilogrammes (= 1·63 cwt.) net weight. The gross weight is to be clearly marked on the outside of the casks.

If cement is packed in casks of different weight, or in bags, it is also necessary to show the gross weight in plain figures on the outside of the cask or bag.

Loss through leakage or differences in weight up to 2 per cent. cannot be claimed for.

The barrels or bags must besides the weight bear on their outside, in plain letters, the name of the firm or the trade-mark.

2. *Time of Setting.*—Portland cement may be ordered either as slow or quick-setting, according to requirements. Cement that only sets in two hours or longer is to be called slow-setting cement.

3. *"Blowing" of Cement.*—Portland cement must not alter its volume, *i.e.*, "blow." The following may be considered a decisive test. A cake of cement may be mixed on a plate of glass, and is to be protected from drying up whilst setting. It is then, after setting, to be submerged in water, and if, after twenty-four hours, it shows small bends on the edges, or cracks, it is to be considered a "blowing" cement.

4. *Fineness of Cement.*—Portland cement must be ground so finely that it leaves, when placed upon a sieve of 900 meshes per square centimètre (=5,806 meshes per square inch, or 76 meshes per lineal inch), at the outside a residue of only 10 per cent. The thickness of the wire is to be equal to half the width of the meshes.

5. *Tests of Strength.*—The cohesive strength of Portland cement is to be tested in a mixture of cement and sand. The test, which must include both the tensile as well as the compressive strength, is to be made in a uniform manner on specimens of equal shape and cross-section, and with machines of the same type.

It is advisable also to test the strength of neat cement.

The test for tensile strength is to be made on briquettes of a breaking area of 5 square centimetres (= 0·775 square inches), and those for compressive strength on cubes with sides of 50 square centimetres (= 7·75 square inches).

6. *Tensile for Compressive Strength.*—Slow-setting cement shall possess, when mixed in the proportion of three parts, by weight, of standard sand to one part, by weight, of cement, and after having been exposed to the air for one day, and placed under water for twenty-seven days, a tensile strength of at least 16 kilogrammes per square centimètre (= 227 lb. per square inch).

The compressive strength must at least be 160 kilogrammes per square centimètre (= 2,270 lb. per square inch).

In the case of quick-setting cement, the strength after twenty-eight days is, generally speaking, lower than that given above, and it is, therefore, necessary to state the time of setting as well as the strength.

WHITEFIELD'S CHAPEL COMPETITION.

Sir,—Without wishing to enter into any discussion on the above, I shall be glad if you will kindly permit me to controvert Professor Smith's dictum, in his letter last week, that a domed ceiling is neither suitable nor safe where clear hearing and speaking are of the first importance. Really it is much to be regretted the Professor should give the weight of his name to a general statement of that kind. It depends entirely on the skill with which the dome is carried out, and no more beautiful or suitable covering for a large central area has ever been devised. Acoustically it has been successful over and over again. Let me instance only two examples in support of this,—the well-known St. Stephen's, Walbrook, and Union Chapel, Islington, the latter being practically a domed church. Both are about the size of that proposed in "Lux Mundi," and both are admirable for hearing and seeing. The question of cost has already been more than answered in Professor Smith's report, but I have always understood that,—within reasonable limits,—the great object is to produce good architecture, not cheap. The whole question is begged in this case by the limit of cost being unreasonable.

J. M. Brydon.

5, Cambridge-place, Regent's Park, N.W.,
October 28, 1890.

Sir,—Professor Roger Smith's letter makes the result of the above more puzzling than ever. I therefore inquire—If Mr. Brydon's design was acoustically bad, and so expensive that it could not be carried out within, or even very near, the limit of cost fixed, why was it awarded a premium?

John Johnson.

OBITUARY.

Mr. J. MacLaren.—The architectural profession has sustained a great loss by the death of Mr. James MacLaren, of 21, King William-street, which occurred on October 20. He will probably be chiefly remembered by his new work at the High School at Stirling. Among his recent works are a large hotel at Las Palmas, Santa Catalina, and a large number of works for Sir Donald Currie, for whom two houses are now being built from his designs at Palace-court, Kensington. Some "Additions to the Park, Ledbury," will be found illustrated in our issue of June 12, 1886; and a house and studio at Avonmore-road, October 19, 1889.

Mr. R. A. Ledward.—The death is announced, at the age of thirty-three, of the promising young sculptor, Mr. R. A. Ledward. During his three years' studentship at South Kensington he gained, amongst many awards, a gold medal for modelling, and was afterwards appointed a master of modelling in these schools. He had been an exhibitor at the Royal Academy for the last eight years.

A Tall Tower for the Isle of Man.—The foundation-stone of the great tower to be erected at Douglas, Isle of Man, was laid on the 21st ult., by the Earl of Lathom. The tower is to comprise six floors, to be used severally as a theatre, dancing-saloon, concert-hall, bazaar, shops, and the topmost has an observatory. The tower will be as high as St. Paul's Cathedral, the estimated cost is about 80,000*l.*, and it is expected that it will be completed by the midsummer of 1892. Mr. Floyd, of Westminster, is the engineer.

Department of Science and Art.—We are informed that the Government institution, now known as the Normal School of Science and Royal School of Mines, will in future be called the Royal College of Science, London.

The Student's Column.

HOT-WATER SUPPLY.—XVIII.

IMPROVED AND OTHER SYSTEMS (*continued*).

OCCASIONALLY advocates for carrying the primary flow-pipe direct from the boiler to the highest point in the house (constituting it both primary and secondary flow), and having the return pipes connected into the cylinder only, as fig. 43,

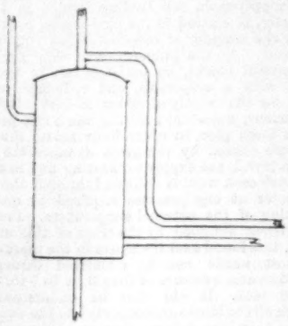


FIG. 43.

are to be met with. This is a practice that should only be resorted to on special occasions, as we have to bear in mind that the store of hot water in the cylinder is not added to, except by the pipe which has been all round the house, and probably lost the major portion of its heat.

By this means, however, hot water is obtained at the taps very quickly, though it is a late hour before there is any in storage of a high temperature; but, as an instance of its successful application, might be mentioned the case of a large residence where trouble had always been experienced in obtaining hot water at the bath in the early morning, as the bath-room was situated a great distance from the kitchen (160 ft. run of pipe), and a considerable time was needed with an ordinary kitchen range boiler to get really hot water at this point, it having first to pass through the cylinder; a change was, therefore, effected, as fig. 43, and the trouble was at an end, as the hot water reached the bath-room in much less time, and, as the pipe was of great length, it held enough in itself for one bath without depending upon the reservoir; but this successful instance must not be construed into a recommendation of the method described.

Another arrangement of connecting-up the pipes to the cylinder and the boiler is as fig. 44, known as "Dyer's system." With this apparatus we must content ourselves with a description

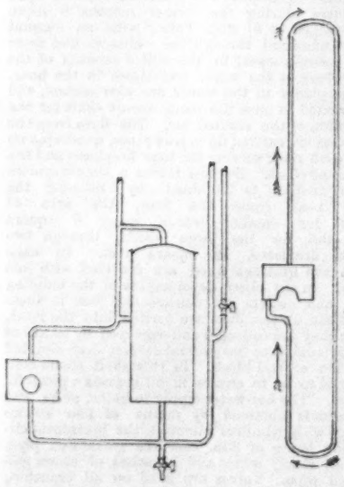


FIG. 44.

FIG. 45.

only, as it does not come within the province of these papers to discuss the merits or demerits of individual systems. It will be noticed that in this the primary flow has communication with the secondary flow, as already explained. The cold supply is carried down and connected into the cylinder at the bottom, and is continued and connected into the boiler at the bottom also, and the secondary return is connected into the cold supply at a low point as shown.

A prevailing notion amongst the majority of hot-water fitters, particularly with some of the stubborn ones, who have been faithfully practising for years what they were taught in their boyhood, is that on no account must the flow-pipe descend anywhere in its course, nor must any circulating-pipe descend below the boiler; nor must, in fact, any pipe take a course that is irregular with the ascent of the flow-pipe and descent of the return which has become traditional, and from which a departure would be looked upon as an offence against all accepted principles.

In theory, several of the best authorities agree that under what we may term common circumstances a circulation can be effected about three-fourths the distance below the boiler that the circulation extends above it, as fig. 45, and the result is arrived at as follows:—First, it is necessary to impress upon the mind that the circulation of water is brought about by the fact that cold water is heavier than hot, *not* that hot water is lighter than cold. This is a distinction with a considerable difference, so far as it affects this argument, for it can be seen plainly that heated water has no inclination to rise unless it is lifted or pushed, so to speak, by a superior force. If we take a vessel of warm water the contents will not rise out of it, but if we take an exactly equal quantity, by measure, of hot water and cold water, and place one in each pan of a pair of scales, we should then find that the pan of hot water would rise, for the simple reason that the superior gravity of the cold water caused it to do so. Now, in an apparatus as at fig. 45, when heat is applied to the boiler its contents become rarefied, or lightened, and a circulation will set in as indicated by the arrows; if, in a short time, we apply the hand to the pipe, we shall find that, starting from the top of the boiler, the pipe is of a less and less temperature as we pass round it towards the bottom of the boiler (in the direction indicated by the arrows). The difference in temperature may be due to two causes, firstly, loss of heat by radiation from the pipes, which, of course, is greater the further we get from the starting-point, and, secondly, the boiler may not have had time to heat up the whole of the contents of the apparatus to boiling-point (for we cannot have a uniform heat everywhere in a circulating apparatus until this temperature is reached, which seldom happens), consequently this makes plain to us that the pipe which ascends from the bottom of the apparatus up into the boiler has the coldest and heaviest water in it, and this is the obstacle that more or less interferes with a good circulation being effected below a boiler. If the lower part of the apparatus extends a greater distance below the boiler than the upper part extends above it, we are given to understand that no circulation will take place, and although this is not strictly correct, it cannot be practically applied in hot water supply work, and, what is more, it is but very rarely required.

It very frequently happens that a fitter would find it very convenient if he could make a dip in his flow- (and return-) pipe, as fig. 46,

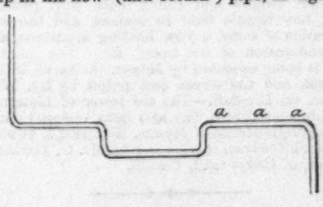


FIG. 46.

for instance; but, according to all accepted ideas, it would possibly ruin the apparatus, but this is not the case, although it might give a good deal of trouble. The trouble experienced in this instance is the difficulty in dislodging the air from the upper part of the service, *a a a*, for it will be found that in such a place the air will remain with the greatest persistency, and to remove it effectually an air-cock would have to be provided for periodical use, as, although we may allow the air to escape when first charging the apparatus, it does not wholly overcome the difficulty, as there is always a certain amount of air carried into the pipes with the water, and this will collect at any such point and require removing regularly, which we cannot expect servants to do. If it was not for the collection of air at this point, there would be no objection whatever to dipping the flow-pipe in the manner indicated, as it would be found that a dip of a few inches only would make no appreciable difference in the circulation.

GENERAL BUILDING NEWS.

ST. MARY'S CHURCH, SOMERS TOWN.—This church was re-opened on Saturday, October 25, after being closed three months for repairs and improvements. The building was originally erected in 1826 by the brothers Inwood, the architects of the neighbouring church of St. Pancras, at a cost of 13,000*l.*, and, with the aid of immense galleries, was estimated to hold nearly 2,000 persons. That its extreme badness was recognised even by contemporaries is proved by a long notice in the *Gentleman's Magazine* for 1827, in which it is described as "the worst specimen of carpenter's Gothic yet erected in this country." The first attempt to bring about some improvement was made two years ago, when a ritual chancel was constructed by raising the floor, and a small apse thrown out, under the superintendence of Mr. Ewan Christian, F.S.A. In the present alterations the galleries have been entirely removed, the walls and roof painted, and to some extent decorated, and new systems of lighting and heating introduced. The long, two-light windows have been broken by the introduction of a band of stone tracery at the level of the old galleries, thus enabling the memorial windows to be worked into their old positions. A set-off under the galleries has been made to carry the line of this traceried band round three sides of the church by means of a moulding and cresting. The piers consisted of thin iron cores surrounded by four three-quarter shafts of wood, and crowned with hideous spreading capitals. An attempt has been made to improve their character by inserting a nail-head moulding between the shafts, and to substitute good Early English types for the "fungoid" caps of the original work. The limited funds at the disposal of the committee were seriously encroached upon by the necessity of removing and making good to the large quantity of bond timber built into the walls, and the whole work would have been greatly hampered had it not been for the generosity of an anonymous benefactor who made up the deficit. The architect is Mr. Reginald Colebrooke Reade, M.A., of Torquay.

NEW CHURCH, CHAPELKNOWE, GRETNA GREEN.—A new United Presbyterian church has just been opened by Principal Cairns at Chapelknowe. The new building is built of stone, accommodates over 200 persons, and has a lofty, open roof. The acoustic and ventilating properties are said to be excellent. Mr. Geo. Dale Oliver, of Carlisle, was the architect.

A NEW BANK FOR LEEDS.—A new branch bank about to be erected for the Birmingham and Midland Bank at Leeds will be situate in Kirkgate, on the south side, and immediately opposite to the Market. The façade will have a frontage of 41 ft. and an elevation 55 ft. in height, which will be executed in stone. The walls of the interior are to be lined with Italian marble; the floor will be paved with mosaic work; the ceiling of the bank richly panelled; and the whole of the counters, desks, and fittings will be of solid walnut. The safes and the voucher-rooms are to be placed in the basement and made fireproof with brick vaulting. The private office, lavatories, and the caretaker's-rooms are to be placed on the first floor. The design has been prepared by Mr. William Bakewell, architect, of Leeds, and will be carried out under his superintendence. The work has been let to Messrs. Nicholson & Son, Heavyside, Barrand, Moore, and Bateman.

ST. JOHN'S CHAPEL, CROOKES' MOOR, SHEFFIELD.—A new Wesleyan chapel in Crookes Moor-road, Sheffield, was opened on the 22nd ult. The chapel is in the Gothic style of architecture. The principal entrances are from the Crookes Moor-road, with a side entrance from Dam-road. In addition to the chapel, which has sittings for 800 persons, there are two large school-rooms, one over the other, and connected by a staircase, around which are clustered on the different levels vestries, class-rooms, and committee-rooms, a large band-room, an infants'-school, and a ladies'-room. The work has been done by the following tradesmen:—Masonry, Mr. J. Fidler, Eckington; joinery, Messrs. W. Crookes & Son, Sheffield; slating, Mr. W. J. Tune; plastering, Messrs. Carter, Unwin, & Son; plumbing and gasfitting, Mr. J. B. Corrie; glazing, Mr. H. Sutton, Birmingham; painting, Mr. C. Chadwick; carving, Mr. F. Tory; warming apparatus, Messrs. J. C. & J. S. Ellis. The pulpit has been erected by Messrs. Johnson & Appleyards, from the architect's designs. Mr. C. J. Innocent, of Sheffield, is the architect, and the clerk of works is Mr. George Malpas.

HOLBORN TOWN HALL.—The London County Council having required additional exits to be provided at the Holborn Town Hall, a new staircase has been constructed at the eastern end, leading into a corridor on the ground-floor, opening into the Clerkenwell-road. New retiring-rooms for gentlemen have also been built on the ground-floor, and for ladies on the first floor, in connexion with the great hall. The principal staircase has been reconstructed in grey and white marble, by Messrs. Farmer & Brindley, of Westminster Bridge-road. An improved system of ventilation has been carried out by Mr. Papier, of Islington, in the great hall, the committee-room, and the residential portion of the building. The whole of the interior of the building has been redecorated by Mr. John Crossley, of Newark. It is proposed to establish an installation of electric lighting in the building. The structural works have been executed by Messrs. Killby & Gayford, of Worship-street, Finsbury. The work has been carried out under the superintendence of the architects, Messrs. L. H. Isaacs & H. L. Florence.

THE NEW FARRINGDON FRUIT MARKET.—The first stone of the new fruit and vegetable market, in Farringdon-road, was laid by the Lord Mayor on the 22nd ult. The building, which will be erected at the corner of Charterhouse-street and Farringdon-road, is designed of iron and glass. The entire site embraces an area of about 54,000 ft., with a frontage of 166 ft. to Charterhouse-street, and 184 ft. to Farringdon-road. The main vehicular and footway entrance to the new building will be in the middle of the Charterhouse-street front, and will be 38 ft. wide. A further entrance, 14 ft. wide, for carriages and pedestrians will be placed at the north end of the Farringdon-road front. Two footway entrances are provided on the Charterhouse street front, and one on the Farringdon-road front, all three affording access to gangways of similar width, traversing the market from south to north and west to east. The height of the building to the plate level will be 23 ft., and to the ridge 46 ft. The basements and the adjoining markets will be occupied by the Great Northern Railway Company. The area of these basements is about 100,000 ft. Large hydraulic lifts are designed to raise the produce to the market, and inclined railways for horse traffic are to be provided as means of access from the basement to the street level. The design is by Mr. Alexander Peebles, the City Architect. The contract for the substructure and basement works has been taken by Messrs. Rudd & Son, of Grantham, at 41,973*l*. The estimated cost of the superstructure is 15,500*l*.

NEW CHURCH, NORTHINGTON.—The new church of St. John the Evangelist, situated on the slope of Northington Down, was consecrated by the Bishop of Guildford recently. The church, which is Late Gothic freely treated in detail, was designed by Mr. T. G. Jackson, M.A., and consists of nave, chancel, tower, and north aisle. It has been erected principally by the estate workmen, and under the superintendence of Mr. Thomas Potter. The walls are of Portland cement concrete, those of the tower being 4 ft. in thickness, faced externally with flint-work and Chilmark stone dressings, and Caen stone internally. The flintwork is inlaid in panels of various designs. The rapid fall of the ground allows of a vestry below the chancel, which takes the form of an octagonal chamber with a central pillar, from which vaultings of stone ribs with panels of red rubbed bricks and stone in bands, spring to the side walls. The chancel terminates in an apse, and contains six two-light windows which are filled with stained glass executed by Messrs. Powell, of Whitefriars. The windows are pointed, with stone mullions. Each of the twelve lights contains the figure of an Apostle. The seating throughout the church is of black American walnut; the nave seats have traceried ends, and carved panels containing heraldic and other devices. The chancel stalls have high backs and canopies and carved standard ends, in which are introduced figures of the four Evangelists and their emblems. The organ case is of the same material, rich in tracery and carving, and overhangs the stalls on the north side. The pulpit is of Caen stone. The reredos is alabaster, with a panel representing the Last Supper, under a canopy with carved and pierced cresting. The chancel is paved with marble mosaic. The tower is principally of Chilmark stone with flint panel inlays. It consists of two stages, the upper of which is lighted on each face with two tracery-headed louvre windows, 24 ft. in height, a parapet of tracery work surmounting the whole. From each angle springs a pinnacle with crocketed spirelets. The wood work generally, including the nave seats, chancel stalls, and organ case, was made in the estate workshops by the estate workmen. Messrs. Farmer & Brindley executed the carving and pavement of the chancel, the reredos, and font. Messrs. Hart, Son, Peard & Co. made the lectern and altar rails. The church is heated by Messrs. Haden & Son's hot air arrangements. The total cost has amounted to nearly 15,000*l*.; the seating accommodation, including choir, is for 260 persons. We gave a view of the church in the *Builder* for June 21, 1890.

NEW MISSION CHURCH, ROMFORD.—On the 23rd ult., the new Mission Church of St. Alban's, Romford, was dedicated by the Bishop of St. Alban's. The church occupies a site at the upper part of Victoria-road. The designs have not yet been entirely carried out, but when completed the church will consist of a nave, 43 ft. 6 in. by 27 ft., a chancel and sacrarium, 25 ft. by 17 ft., a south porch, a clergy and choir vestry on the north side, with a *flèche* at the east end of the nave. The vestry, porch, and spire are the portions which remain to be added. The cost of the whole design is estimated at about 1,200*l*. The architect is Mr. James Kennedy, of London, and the builders are Messrs. Dowsing & Davis, of Romford.

NEW HOSPITAL FOR BROMSGROVE, NEAR BIRMINGHAM.—The foundation-stone of a Cottage Hospital, which is to be erected on the New-road, Bromsgrove, was laid on the 22nd ult. by Mr. John Corbett, M.P. The buildings will consist of a central block and two side wings connected by corridors. The wings will form the male and female wards respectively; they will be 35 ft. by 18 ft. 6 in. by 12 ft. 6 in. in height, and they will each have six beds. The material used will be red brick, with pressed bricks for certain portions, and stone will be used for the main entrance and certain of the windows. The gables will be finished in the half-timbered style, and the whole of the roofs will be covered with purple Staffordshire tiles. The floors of the wards and the day and matron's rooms will be of wood, those of the wards being laid double. The central hall will be warmed with hot-water pipes, and special arrangements are to be made for ventilation and lighting. The builders are Messrs. J. Brazier & Son, of Bromsgrove. The architect is Mr. John Cotton, of Birmingham and Bromsgrove.

NEW CHAPEL FOR CARDIFF.—A new Bible Christian Chapel, Miskin-street, Cathays, Cardiff, was opened on the 22nd ult. The building, which will seat about 600 persons, has cost over 2,000*l*. The architect was Mr. J. F. Fawckner, of Newport, and the builder Mr. L. Purnell, while Mr. A. M. Blake acted as clerk of the works.

NEW CHURCH, CANTERBURY-ROAD, S.E.—The Bishop of Rochester on the 25th ult. dedicated a new church and hall at Canterbury-road, S.E., which has been erected by Corpus Christi College (Cambridge) in connexion with their Mission at Camberwell. The building consists of two floors, having a large hall, &c., on the ground-floor and a church on the first-floor. The church is distinct from the lower part, and is approached by two wide stone staircases with direct access to the street. The building has fireproof floors, and has cost nearly 5,000*l*. The architect is Mr. Richard J. Lovell, A.R.I.B.A.

THE ENLARGEMENT OF STAMFORD-HILL SCHOOLS.—We understand that the Tottenham School Board have instructed Mr. Charles Bell, architect, to prepare designs for the enlargement of the Stamford-hill Schools for 500 children.

NEW SCHOOL FOR ABBEYDALE.—A new school which has been erected by the Sheffield School Board, at Abbeydale, was opened on Monday last. The building is two stories high. Coursed wallstone is used on all sides of the school, with ashlar dressings, and Westmoreland slates. Pitch pine is applied for all interior woodwork. Accommodation is provided on the ground floor for 420 boys, and on the upper floor for 420 girls, one class-room being fitted up for cookery instruction. Wood block flooring is laid, and the interior is well lighted, warmed, and ventilated. The contract for the building, including boundary walling, is 5,770*l*. The contractors for the work are Messrs. Thomas Lowe & Sons, of Burton. The architect is Mr. C. J. Innocent, F.R.I.B.A., of Sheffield, and Mr. J. Laidler has acted as Clerk of the Works.

CHURCH RESTORATION NEAR CARDIFF.—We are informed that the restoration of Peterstone-sup-Ely Church, for which a faculty has been granted, has been entrusted to Messrs. Kempson & Fowler, architects, of Llandaff. The work includes a new solid oak chancel, arch screen, and pulpit, new oak chancel seats, new two-light chancel window, the raising of the east window and filling both with painted glass, new mosaic floor in chancel, and the wall decoration of same, a new heating apparatus, and the restoration of the tower, &c. The painted glass is being executed by Messrs. A. Savell & Co., London, and the screen and pulpit by Mr. Wm. Clarke, of Llandaff.—The old tower of Llamshen Church, near Cardiff, has also been restored under the superintendence of Messrs. Kempson & Fowler. The work has been carried out by Mr. G. Hartnell, builder, of Crwys-road, Cardiff.

SANITARY AND ENGINEERING NEWS.

THE NEW ROYAL INFIRMARY, LIVERPOOL.—The heating and ventilation, as well as the steam and hot-water service supplies, for this building have been carried out by Mr. Wilson W. Phipson, Mem. Inst. C.E., who was selected, in a limited competition, prior to the contract for the building being given out. By this means the architect, Mr. Alfred Waterhouse, R.A., was able to devote much time and attention to the subject, and to embody all details of the scheme in his plans. The heating is by low-pressure steam, the water of condensation being returned to the boiler-room after having passed through the several systems of heating-mains and radiators, being finally put into the boilers by means of a Worthington steam pump. Two 50 h.-p. Galloway steam-boilers are provided for this and the other services. They are set on the Livet principle, and are fitted with all the latest improvements, in order to ensure an economical cost of annual maintenance. Six service-pipes are taken from the main connecting the two boilers, No. 1 being for heating, No. 2 for the kitchen and ventilating coils, Nos. 3 and 4 for the laundry, No. 5 for the pumping service, and No. 6 for the disinfecting apparatus. On each of them stop-valves are fixed, by which means all these services are under the control of the engineer in the boiler-room. The supply-main for heating, which is 4 in. in diameter, is carried in the pipe-tunnel constructed below the corridor of communication running east and west. At the intersection of this corridor by the several blocks, an outlet is left in the main, fitted with a stop-valve, and reducing pressure valve for the supply of steam to each block. By this means, while still retaining the boiler pressure in the main pipe, in order to overcome the loss of pressure caused by the great distance the steam has to travel, the supply for heating and in circulation over each ward is delivered through the reducing valve at any pressure required to meet the variation of the external temperature. From the experience obtained by the trials of this arrangement, it is found that the steam in the most distant or west wards can be circulated through the radiators at a pressure of from 3 lb. to 5 lb. on the square inch. It will thus be understood that though all the blocks are connected to the one steam supply from the boilers, they are independent in their action, and under control at the points where the supply and return mains leave and re-enter the main tunnel above referred to. The mains are of the best quality of steam-pipe, faced flange-joints being used for all pipes over 2 in. in diameter, while right and left screw joints are used for pipes of 2 in. and under. In all cases due allowance is made for the expansion and contraction of the pipes by the frequent use of long and easy bends, and swinging the mains where necessary. By this practice the disadvantage of telescope or other forms of expansion joints is avoided. In order to estimate the extent of this apparatus, it may be mentioned that over 13,000 superficial feet of steam and hot-water mains have been coated with Messrs. Leroy & Co.'s non-conducting composition, and in addition to this there are 6,000 superficial feet of branches that are not coated, while the direct heating surfaces fixed throughout the building are estimated at 8,000 square feet. The heating of the building throughout is by means of steam radiators, now known under the name of "Sunbeam," and manufactured by Messrs. Longden & Co., of Sheffield. The advantage of these radiators is that the loops are connected to the base by a Whitworth screw joint, and all parts of them are interchangeable; therefore, should a loop be accidentally broken, no trouble is experienced in renewing the same while the radiator is in position. In the wards the radiators are circular and are fixed in a central position. The heating in all cases is from the centre, because it is found in practice that it causes less disturbance of the atmosphere in the wards than when the radiators are placed against the external walls. The heating from the central position causes a current of warm air down the side walls. To all the circular radiators a direct supply of fresh air is provided, and the heating power fixed upon has been calculated to ensure, in conjunction with the open fire-places, during the winter months a mean temperature of 61 deg. Fahr., with an amount of air admitted through the radiators and from other sources equal to the entire renewal of the atmosphere in the wards four times in the hour. The fireplaces in the wards are also central, and constructed to form the main upcast shaft for the extraction of the vitiated air. The flues from the fireplaces are carried up in iron pipes, quadruple on plan, each stack serving for four fireplaces and the extracting shaft. By this means a simple system of extraction is obtained by utilising the waste heat from the fires, the area of outlet for smaller wards being 6 square feet, and for the large wards, through two central fireplaces, 12 square feet. In each outlet the gratings fixed are provided with talc valves. In the other departments of the building inlets and outlets are constructed, but in these rooms the up-cast flues are carried into the roofs, where they are collected and conveyed by means of a main trunk into the general extract shaft situated over the central block. In this shaft steam coils are fixed so as to ensure in all seasons a powerful up-cast. The hot-water supply to baths, sinks, and lavatories is obtained by means of four steam-heaters with cylinders attached, the horizontal circulation being of 3-in. cast-iron galvanised pipe, with all rising mains and branches of steam galvanised pipe. Valves are fixed on all branches, so that, in case of repair to pipes, no interruption will take place in the general supply. In order to economise fuel, the condensed-water mains are passed through the heaters before being returned to the boiler-house. For the administration block a distinct branch, with valve and reducing-pressure valve, is taken from the main steam supply, for heating, ventilation, and hot-water service supplies.

THE SKIPTON WATER SUPPLY.—A statutory meeting of the members of the Skipton Local Board was held on the 22nd ult. for the purpose of considering and deciding upon the expediency of promoting a bill in the next session of Parliament for an extended water supply. The Chairman read and explained the scheme as proposed by Mr. Hill, the Engineer, which provided for the construction of a reservoir at Skibeden capable of holding 110,000,000 gallons of water, which, together with the purchase of land, &c., would cost not more than 40,000*l*. Resolutions were passed in favour of the scheme.

WEYMOUTH HARBOUR.—We briefly mentioned in our issue for the 18th ult. the ceremony of laying the final stone in connexion with the new quay. We omitted to state then in connexion with the improvements to this harbour that an amount of about 40,000*l*. had been expended under the directions of Mr. Barlow-Morgan, Civil Engineer.

STAINED GLASS AND DECORATION.

NEW WINDOW, PRIORY CHURCH, CHRISTCHURCH, HANTS.—The old Priory Church of Christchurch, Hants, which dates back to early Saxon times, has received another stained glass window, the gift of Mrs. Bush, the wife of the present vicar. The window consists of three lights with tracery above, and represents "St. John taking the Blessed Virgin home," "Mary at the feet of Jesus," and the calling of St. James and St. John. The work has been designed and executed by Messrs. Mayer & Co., of Munich and New Bond-street, London.

NEW STAINED GLASS WINDOWS FOR MANCHESTER CATHEDRAL.—On the 22nd ult. in the north aisle of the Manchester Cathedral, two stained glass windows were presented to the authorities of the Cathedral by Miss Pickup. They are the two last in the north aisle which remained plain. The easternmost is dedicated to the memory of George and Elizabeth Pickup, father and mother of the donor, and that next to the porch is in memory of Mr. James Pickup. The work has been carried out by Clayton & Bell, of London. There are small figures in the principal lights formed by the upper tracery, and the main portion of each window is divided by the mullions and transom into eight lights, in each of which is a figure illustrating some Biblical or sacred subject.

FOREIGN AND COLONIAL.

FRANCE.—An international fine art exhibition is to be opened, on February 18, 1891, at the Place Bellecourt at Lyons.——The committee for the industrial exhibition at Lyons in 1892 have awarded MM. Borleau, Mignan, & Maistrasse, architects, of Paris, the first premium in the competition for the exhibition building.——Baron Alphonse de Rothschild has presented to the museum at Bordeaux an important series of medals executed by M. Ringel d'Illzach.——M. Guillaume, the architect to the Louvre, has discovered in the Pavillon de Flore, in the rooms formerly occupied by the Prefecture of the Seine, a number of mosaics, probably from some town in the South of France, but of which nothing certain is known. They had been sent before the war to the architect Lefuel.——A group of French capitalists have formed a scheme for opening next summer, at Buda Pesth, an industrial exhibition organised on the model of the French Exhibition in London.——Mdme. Schneider, widow of Louis Schneider, the engineer, has left a sum of more than 100,000 francs to the Association of Painters, Sculptors, Architects, and Engravers.——The Société des Artistes Français has been authorised to accept the legacy left to it by Heilbuth, consisting of a house, 47, Rue Ampère, Paris, valued at about 250,000 francs.——The Municipality of Rouen proposes to celebrate next year the centenary of the birth of Géricault, the painter, who was born there on September 26, 1791.——The Municipal Council of Chambéry have opened a subscription for the erection in that town of a monument commemorating the annexation of Savoy to France in 1792.——At the little town of Auffay a monument is to be erected to the memory of a brave woman, Marie Biard, who during the Franco-German war many times traversed the Prussian lines at the imminent risk of her life, in order to carry despatches to the French army.——In the communes of Colombes and Gennevilliers there are to be commenced shortly the works necessary for conducting the Paris sewage, by lifts established at Clichy, into the forest of St. Germain and the plain of Achères, where they are to be utilised for agricultural purposes. This operation, often spoken of, has now received the sanction of the Government.——A public subscription has been opened for the erection at Carpentras of a statue to the celebrated chemist François Raspail, who was born in that town in 1794. The sculptor is not yet selected.——A new line of railway has been opened from Montauroux to Grasse (Alpes Maritimes) which is to unite Nice, for strategic purposes, with Grenoble, Toulon, and Marseilles.——The French Government intends to erect at Navarino a monument in commemoration of the celebrated Naval victory gained there over the Turks, in 1827, by the combined fleets of England France and Russia. The monument will stand by the seashore, and will be nearly 40 mètres in height.

NORWAY.—Seventeen designs have been received for the new Historical Museum to be built in Christiania.——The new theatre building in the capital is now approaching completion. It will seat about 1,000 persons.——A few years ago a Norwegian architect, who takes great interest in Norse architecture, purchased the Haaves church, in Sogu, on the west coast of Norway, and one of the oldest in the country, for the sum of 23*l*. He has since expended some 50*l*. and a great deal of labour in restoring the church, and furnishing it in accordance with its date.——The first venture in cement manufacture in Norway, to which we recently referred, seems likely to be a success. At some trials the other day in Christiania by a body of experts, the Norwegian material is said to have proved quite equal to English briquettes in quality.

SWEDEN.—It is proposed to obtain a State grant of 8,500*l*. towards sending Swedish architects and engineers to the forthcoming Chicago International Exhibition.——New barracks for the accommodation of the Swedish Life Guards are to be erected in Stockholm.——The designs have now been completed for the Museum of Northern Antiquities to be erected in Stockholm, and the work will be commenced next spring.——In the town of Helsingborg there has just been completed a Masonic hall at a cost of 13,000*l*.

DENMARK.—Work is now in full progress with the erection of the new great central electrical station in Copenhagen. It is estimated to cost about 75,000*l*.

THE WATER SUPPLY IN EGYPT.—It is stated that Mr. Cope Whitehouse has renewed his application for leave to carry out the Raiyan project. He offers to deliver water in sufficient quantity to double the available volume during low Nile for 70*l*. per million cubic mètres of water delivered at Cairo, with a right of purchase of the canal and reservoir by the Egyptian Government at one million pounds. He insists that the Egyptian Government has no legal right to prevent the execution of the proposed works as a private enterprise.

MISCELLANEOUS.

DOVERIDGE HALL.—On October 23 last, at the Mart, the Doveridge Hall estate was bought in at a bid of 170,000*l*. Owned by Lord Waterpark, this property extends over 2,000 acres, and includes East Lodge (a hunting-box occupied by Lord Waterpark), Cavendish Lodge, fourteen farms (chiefly dairy land), several cottages in the village, a water corn-mill, with several small holdings. The annual rent-roll amounts to 5,750*l*. The mansion, now tenanted by Lord Hindlip, was built in 1763, in the Classical style, of red brick with stone dressings. The main front, between two low wings, has a rustic ground-floor, supporting a two-storied pediment with four pilasters, and two (central) columns partly engaged, in the Ionic order. The Hall is distant one mile and a half eastwards from Uttoxeter, whence the main road to Derby traverses the estate, which is bounded along its western side by the Dove. Nine miles northwards lies Ashborne, famed for its neighbouring beauties of Beresford Dale and Doveside, and for its own parish church of St. Oswald. Samuel Johnson often visited Dr. Taylor when rector here; whilst the memories of Izaak Walton, his friend Cotton, Rousseau, Congreve, and Tom Moore are associated with this locality. The church was dedicated in 1241 by Hugh de Patteshull, Bishop of Coventry. It contains several monuments and tombs of the Cockayne, Bradburne, and Boothby families and J. Banks' statue of Penelope, only child of Sir Brooke Boothby, Bart., who died aged five years, in 1791. The tower, with its lofty spire, was restored in 1873; the chancel, by the late Sir G. Gilbert Scott, four years later. The Cockaynes were settled at Ashborne Hall from the twelfth to the seventeenth century, when Sir Aston Cockayne sold it to the Boothbys, who, in two days, were dispossessed by Prince Charles Edward, with the Marquess of Tullibardine and James Drummond, Duke of Perth, on his advance and retreat through Derbyshire. This part of the county will be rendered more accessible by a proposed line of the London and North-Western Railway to pass from Ashborne and Hartington to Cromford, near to Matlock, and so on to Buxton.

OPENING OF A NEW LONDON PARK.—Maryon Park, Charlton, was formally handed over to the London County Council on the 25th ult. by the donor, Sir M. Maryon Wilson, Bart., Lord of the Manor of Charlton. The ground covers an area of about thirteen acres, and is of an undulating character, its special features being a high, abrupt, and rugged hill, called Cox's Mount, a precipitous cliff on the opposite side revealing 60 ft. of geological strata, and a small plain between suitable for cricket and other games.

ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS.—The following gentlemen having satisfied the examiners at the examination held in London on the 3rd and 4th ult., they have been granted certificates of competency by the Council of the Association:—Messrs. C. F. Ball (Croydon), W. Dyach (Aberdeen), F. J. Edge (Neath), W. Hall (Ealing), J. Manley (Chacewater), and F. Sumner (Kilburn). The next examination will be held in London in April, 1891.

HEATING FEED-WATER.—There is something very remarkable in the slowness with which steam users recognise the great saving they may make in their weekly coal bill by the use of feed-water heaters. In many places the gain, which might be secured at no very great outlay, would make all the difference between a dividend and no dividend. At a meeting of a paper manufacturing company a short time since, it was mentioned that this one firm used 250 tons of coal per week, and that the recent increase in the price of coal made an increase of 2,600*l*. per year in the fuel bill, which made a reduction of 4 per cent. in the dividend, or from 12 to 8 per cent. This is only one of many works whereat such large quantities of fuel are consumed, and it is well known to engineers that it is the exception rather than the rule to heat the feed-water on its way to the boilers. Yet by this means some firms are now making a saving which represents a large income. A very moderate estimate of the value of a heater which raises the feed-water from a normal temperature to about 200 degrees is the saving of 10 per cent. of the fuel used. This, where coal costs 1*l*. per ton, and where, as in the above case, 250 tons per week are used, represents a saving of 1,250*l*. per year; or probably a dividend of 50 per cent. to 60 per cent. per year on the capital expended on the feed-water heaters.—*Engineer.*

IS THERE COAL BENEATH LONDON?—Professor T. G. Bonney gave a lecture on the 25th ult., at the Working Men's College, Great Ormond-street, on the above subject. Professor Bonney said borings had been made at Dover, and at a depth of 1,220 ft. (100 ft. below where coal had been struck in Calais) a seam of good burning coal had been struck 3 ft. in thickness, which showed that the coal measures must pass under the Channel, and if the beds were trending in the same way as in approaching Calais, it was obvious that they should pass very nearly through London itself. The difficulty, however, was to trace them. In his opinion there was no chance of striking coal measures north of Croydon, though they might underlie the ground at no great distance from south of Croydon. But he was of opinion that coal was not to be obtained underneath London. Even if, in the future, collieries did spoil the scenery of Kent and Sussex, they were not likely to much increase by their smoke the thickness of our London fogs.

IMPROVEMENTS IN NAPLES.—According to a recent report of the Acting British Consul at Naples, the sanitary reorganisation of the old parts of the city was commenced in May last year, and the works have been carried on with great activity ever since. The "Società di Risanamento" have contracted to complete the whole work of demolition and reconstruction in ten years. In the new buildings, 35,881 square yards are to be devoted to habitations for the poorer classes, and 95,683 square yards are to be built over with habitations of an economical type, consisting of dwellings having one, two, and three rooms, with the necessary offices. All the works are to be carried on under the inspection of a Special Municipal Commission appointed by the Communal Council. The new embankment at Santa Lucia proceeds rapidly. The new part near the "Castello dell' Ovo" and the new dwelling-houses for fishermen and stores for boat gear and fishing apparatus have been completed.

LEGAL.

BUILDING BEYOND THE LINE OF FRONTAGE.

AT the Lambeth Police-court on Monday, two summonses were heard against the City and South London Railway Company for building stations at the corner of New-street, Kennington-park-road, and Harleyford-road, beyond the line of frontage, and without consent in writing of the London County Council, contrary to the Statute 25 & 26 Vict., cap. 102, and 45 Vict., cap. 14.—Mr. William Graham appeared in support of the complainants, the London County Council, and Mr. R. C. Glen for the Company.—From the opening statement of Mr. Graham and the evidence of several witnesses, it appeared that the company's stations, one at the corner of New-street, Kennington-park-road, and the second at the corner of Harleyford-road, had been built upon the old forecourts of houses, and brought out right to the garden rail, and beyond the original and proper line of frontage. A good deal of evidence was gone into as to the size and style of the stations, and the necessity of having them built in the way complained of. The County Council considered the Company had built such stations without sanction, and contrary to the Building Act. The defence was that the Company had powers under their own Act of Parliament to do as they had.—Mr. Mullins, clerk to Mr. Bannister Fletcher, District Surveyor, was called, and he stated that in May, when the station at New-cross was in course of erection, communications had been sent to the Company, and a caution was given them that such building was beyond the proper line of frontage, and that they might be proceeded against. The further hearing of the case was adjourned.

COMPETITION, CONTRACTS, AND PUBLIC APPOINTMENTS.

COMPETITION.

Nature of Work.	By whom Advertised	Premium.	Designs to be delivered.
*Designs and Estimates for Church, Exmouth	The Committee	15*l.* and 5*l.*	Jan. 1

CONTRACTS.

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Public Road Improvements	Beckenham Local Bd.	G. B. Carlton	Nov. 3
*Private Street Improvements	do.	do.	do.
Retort House and other Buildings	Belfast Corporation	*Official*	Nov. 4
Metalling, Sewering, Paving, &c.	Stone Local Board	do.	do.
Cast-iron Water Main (6 miles)	Fylde Waterworks Co.	Edwd. Garlick	do.
Boiler Tubes, Ironwork, &c.	India Office	*Official*	do.
*Supply of Cast-iron Work	Com. of Sewers	do.	do.
*Paving, &c. Works	Waltham Holy Cross Local Board	C. W. Wiggs	do.
*Supply of Timber	G. W. R. Co.	*Official*	do
*Roadmaking and Paving Works	Hammersmith Vestry	H. Muir	Nov. 5
*Swimming Bath	Hackney Union	*Official*	do.
*Pipe Sewers, &c.	Bethnal Green Vestry	F. W. Barratt	Nov. 6
*Paving Works	do.	do.	do.
*Waterworks	Quorndon Local Board	G. Hodson	do.
Presbyterian Church, Newtownabrede, Ireland	Rev. R. Workman	Vincent Craig	do.
Turbine Pump-house and other Works	Windsor Corporation	*Official*	do.
*Works at St. Pancras, Bradford, and Colne	Midland Ry. Co.	do.	Nov. 7
Methodist Chapel, near Newburn-on-Tyne		Joseph Shields	Nov. 10
Re-construction of Avenue	Horfield Local Board	A. P. J. Cotterell	Nov. 11
Iron Roofing, &c.	South Indian Ry. Co.	*Official*	do.
*Making-up Roads and Paving Footways	Willesden Local Board	O. Claude Robson	do.
*Repairing Road	Borough of Croydon	*Official*	do.
*Erection of Houses and Alterations, Elgin	The Admiralty	do.	do.
*Paving Works	Lewisham Bd. of Wks.	do.	do.
*Oak Fencing, New Southgate	Recreation Ground Com.	do.	do.
*Cookery Room and Class Rooms at School	Walthamstow Sch. Bd.	W. A. Longmore	do.
*Roadmaking and Paving Works	Fulham Vestry	W. Sykes	Nov. 12
*New Wards and Workshops, Finmstead	Woolwich Union	J. O. Cook	do.
*Fire-escape Staircases, Finmstead	do.	do.	do.
*Supply of Stores for 1891	Midland Ry. Co.	*Official*	do.

CONTRACTS.—*Continued.*

Nature of Work or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.
*Sewerage Works	Barking Town Loc. Bd.	C. J. Dawson	Nov. 13
Restoration of Church, Upwey, Dorchester	Rev. F. B. Howell		do.
Beech Wedges	The Admiralty	*Official*	do.
Roadmaking and Paving	Billesdon (Leicester) U.R.S.A.	W. F. Ault	Nov. 14
Extension of Infirmaries at Asylum, Morpeth		Mr. Cresswell	Nov. 15
*Sewerage Works, Poplar	London County Council	*Official*	Nov. 17
*Sewerage Works, Hammersmith	do.	do.	do.
*Works and Repairs to Sewers and Drains	Paddington Vestry	do.	do.
Alterations, Additions, &c. of Coffee Tavern	Swansea Coffee Public-House Co. Lim.	J. B. Wilson and G. Moxham	Nov. 18
*New Schools, Tarpaving, and Roadmaking	Barking School Board	C. J. Dawson	Nov. 19
*Machinery for Sewage Works	York Corporation	J. Mansergh	Nov. 24
*Construction of Sewers, &c.	do.	do.	do.
*Quarters for Officers, Brompton, &c.	War Department	*Official*	No date
*Lavatory and Bathroom, Iron Balconies, Stairs, &c.	Mile End Guardians	C. P. Burden	do.
Stable, Cartshed, &c. Bramley, Leeds	T. Haley & Co.		do.
Four Dwelling-houses, Headingley, Leeds	Mr. Swallow		do.
Laying-down and Fixing Machinery, &c.	Cardiff Floating Dock, &c. Co. Lim.	*Official*	do.
Twenty-five Cottages	Pelton Colliery, Chester-le-street		do.
Works on River Lud	Louth Corporation	*Official*	do.
Boys' school, Gateshead-on-Tyne		Stephen Piper	do.
Six Through Houses, Hunslet, Leeds			do.
House and Alterations, East Cramlington	Mr. Heron		do.

PUBLIC APPOINTMENTS.

Nature of Appointment.	By whom Advertised.	Salary	Applications to be in
*Clerk of Works	Manchester Corp.	3*l.* 3*s.* per week	Nov. 8
*Rate Collector	Ilford Local Board	100*l.*	do.
*Engineer's Measuring Surveyor	London County Council	200*l.*	Nov. 11
*Architect's Measuring Surveyor	do.	200*l.*	do.
*Surveyor's Clerk	do.	100*l.*	do.
*Surveyor and Inspector of Nuisances	New Malden Loc. Bd.	100*l.*	Nov. 15
*Sanitary Inspector	County of Perth	300*l.*	Nov. 20

Those marked with an Asterisk (*) are advertised in this Number. *Competition, p.* iv. *Contracts, pp.* iv., vi., *and* viii. *Public Appointments, p.* xvi.

A SPECIAL RECEIPT FORM CASE.

At the Walsall County Court recently, before Judge Griffith, the case of Broadbent *v.* Lewis came on for the fourth time.—Mr. Toller was for the plaintiff, and Mr. A. Young for the defendant.—The plaintiff, a builder's merchant in Leicester, claimed 39*l.* 2*s.* 3*d.* (less 5 per cent.) for goods sold and delivered, and the defendant, a builder in Walsall, pleaded that the money had already been paid to a man named Lane, formerly the plaintiff's traveller, but since dead. The payment to Lane was not denied, but it was contended that it was an invalid payment, the defendant having disregarded a notice printed on all bills and invoices, that no receipt would be valid unless given upon a special printed form, and having accepted a written receipt upon the account. When the case was first heard a verdict was given for the defendant. Then on an application to the High Court to set aside that verdict, a new trial was ordered, and the case was subsequently before the Walsall County Court on two occasions, on each of which the jury disagreed.—Mr. Toller, in opening the case on this occasion, said the real point at issue was whether the defendant had exercised such reasonable care as ought to be exercised by an ordinary business man.—Mr. Young, for the defence, contended that express notice ought to have been given to the defendant that Lane was not authorised to receive money.—The jury were unable to agree.—Mr. Toller asked that the case might be sent for trial in another Court.—Mr. Young objected, but suggested a reference to arbitration, but Mr. Toller declined to consent.

PROFESSIONAL FEES.

DURMAR AND GIBBS *v.* DUNN AND SONS.

In the Westminster County Court, on Monday, this case came before Judge Bayley. The plaintiffs, a firm of architects and surveyors, sought to recover 35*l.* for professional services rendered to the defendants, builders, of 31, Brewer-street, W.

Mr. Elliott appeared for the plaintiffs, and Mr. Beaumont Maurice for the defendants.

The plaintiffs' case was that the defendants had a lease of the above-named premises, which would shortly fall in, and, being desirous of renewing it, they applied to the Commissioners of Woods and Forests for a new lease, and then the plaintiffs were introduced to the defendants, and were instructed to draw plans and submit them to the Crown Surveyor, for which they said it was necessary to make an extensive survey, and for that they were to be paid 10*l.* and 5 per cent. on the estimated cost of the work for drawing the plans. If the work was not done the commission should be 2½ per cent. The work was never carried out, and the defendants had paid nothing for it, hence the present action.

The defence was that the 10*l.* paid into Court was more than sufficient to pay for the work done. The plaintiffs represented that they had interest with the Crown Surveyors, and that the plans they drew were absolutely necessary, when they were not. The plaintiffs had agreed to do what was done for seven guineas.

His Honour held that the plaintiffs led the defendants to believe that extensive plans were necessary and that they had influence with the Crown Surveyor. He thought the amount paid into Court was sufficient, and gave judgment for the defendants, with costs.

MEETINGS.

SATURDAY, NOVEMBER 1.

Association of Public Sanitary Inspectors.—Inaugural Address by the President, Dr. B. W. Richardson, F.R.S., entitled, "A Pioneer of Sanitary Science." 6 p.m.

MONDAY, NOVEMBER 3.

Royal Institute of British Architects.—Opening address of the Session by the President, Mr. Alfred Waterhouse, R.A. 8 p.m.

Society of Engineers.—Mr. Percy Griffith on "The Treatment and Utilisation of Exhaust Steam." 7.30 p.m.

Clerks of Works' Association (Carpenters' Hall).—Paper by Mr. T. Edmond. 8 p.m.

Royal Institution.—General monthly meeting. 5 p.m.

Liverpool Architectural Society.—Paper by Mr. J. H. Woodhouse entitled "A Few Recent Notes in Holland and Belgium." 7 p.m.

TUESDAY, NOVEMBER 4.

National Association for the Advancement of Art and its Application to Industry.—Annual Congress, Birmingham.

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. F. J. Sykes on "General Powers and Duties of Inspectors of Nuisances." 8 p.m.

Society of Biblical Archæology.—8 p.m.

Glasgow Architectural Association.—Mr. R. J. Gildard on "Greek Architecture: Late Period." 8 p.m.

WEDNESDAY, NOVEMBER 5.

National Association for the Advancement of Art and its Application to Industry.—Annual Congress, Birmingham (continued).

London Society for the Extension of University Teaching (Chelsea Centre).—Mr. Walter Leaf on "Heroic Fortresses and Architecture." 5.15 p.m.

THURSDAY, NOVEMBER 6.

National Association for the Advancement of Art and its Application to Industry.—Annual Congress, Birmingham (continued).

Royal Academy of Arts.—Professor A. H. Church, M.A., F.R.S., on "The Chemistry of Painting: Grounds." 4 p.m.

FRIDAY, NOVEMBER 7.

National Association for the Advancement of Art and its Application to Industry.—Annual Congress, Birmingham (continued).

Sanitary Institute (Lectures for Sanitary Officers).—Mr. J. F. J. Sykes on "Objects and Methods of Inspection." 8 p.m.

SATURDAY, NOVEMBER 8.

National Association for the Advancement of Art and its Application to Industry.—Annual Congress, Birmingham (concluded).

RECENT PATENTS:

ABSTRACTS OF SPECIFICATIONS.

16,860.—Door Closer: *E. C. Urry and another.*—This invention consists of a closer acting with a shoe, like many other patterns, but with a special arrangement of arms and levers acted upon by springs and guided by friction-rollers, which, while lessening the friction, give ease and efficiency in work.

17,758.—New Building Material: *H. A. Bassett.*—This patent is for a new composition for use in the manufacture of building materials, serving to produce the binding and hardening of the substances forming the bulk of the material. The composition is made with glue, oil, and water, and is then mixed with plaster and borax, to be used as wished, for ceilings, walls, or enrichments, or for artificial stone.

17,898.—Ventilating Drains: *A. Young.*—According to this invention, two bell-shaped receivers or chambers are used, and these chambers are heated by gas and by coils and with asbestos packing. The sewer-gas passing up is drawn through these chambers and burnt, the small residuum (if any) escaping by the outlet provided—say, the ordinary street-lamp.

8,402.—Water-closet Fittings: *R. Frame and A. C. Neff.*—This invention relates to the construction of water-closets, &c., holding water at a fixed level, the permanent overflow point to be discharged on additional water entering the bowl by siphonic action, and consists of a new and improved device for this and also a device for reducing the noise made in such closets by the breaking of the siphon when it takes air at the mouth of the receiving limb when the closet is discharged of its contents.

11,444.—Spiral Stairways: *W. P. Thompson.*—Metallic sections, according to this patent, are adapted to be combined to build up a complete spiral stairway and to form, if desired, a double spiral stairway from a common centre. The risers and treads have an eye or socket and groove which fits them together round a common centre.

12,62.—Detecting Leakages in Soil-pipes: *R. T. Crane.*—This invention has for its object a method for detecting leaks in soil-pipes. A detective fluid with pungent scent is introduced in a phial through a perfectly sealed receptacle and then broken in the pipe so that wherever the odour is detected a leak is certain and there is no uncertainty from the odour hanging about without coming through the pipe.

NEW APPLICATIONS FOR LETTERS PATENT.

October 13.—16,231, P. Crean, Kiln for Burning Bricks, &c.—16,235, J. Stones and A. Gradwell, Girder Gutter for Ridge and Furrow Roofs.—16,284, T. Edwards, Use of Concrete, Cement, Artificial Stone, &c., for Building Purposes.

October 14.—16,290, T. Pollard, Chimney Pots or Flues.—16,305, A. Ross, Water Cisterns.—16,328, H. Green, Spirit Levels.

October 15.—16,372, S. Meggitt, Automatic Window Fastener.—16,373, J. Littler, Prevention of Steam or Moisture on Windows, Walls, &c.—16,394, F. Ham and R. Preston, Siphon Cisterns.

October 16.—16,473, E. Blount, Door Checks.—16,479, J. Jones, Cowls or Ventilators.—16,485, S. Bouchier, Window Sash-fasteners.

October 17.—16,510, J. Wood, Preventing the Escape of Smoke from Chimneys.

October 18.—16,554, S. Bouchier, Window Sash-fastener.—16,601, A. Middie, Sash-fasteners.—16,609, W. Horn, Mitre Cutting Machine.—16,622, W. Drayson and P. Bright, Basins for Lavatories, Urinals, &c.

PROVISIONAL SPECIFICATIONS ACCEPTED.

9,321, Don Pastor de la Sala, Joinery.—14,162, J. Bott, Circular Saws.—14,184, J. Sears, Ventilators.—14,328, H. Bonnycastle and T. Rymer-Jones, Refractory and Non-Conducting Bricks, &c.—14,766, E. Haddon, Windows and Window Fasteners.—14,822, J. Sears, Ventilators.—15,263, W. Wall, Combined Door Bolt and Indicator.—15,283, E. Thomson, Ascertaining immediately whether exit doors or entrances of theatres and other buildings are unfastened or not.—15,441, W. Kimberley, Combined Plane and Oil Stone.—15,632, R. Parker and A. Dagley, Cowls.—15,654, C. Cox and F. Robinson, Switches for Walls or Ceilings for Electric Light.—15,782, J. and A. Chiverall, Polishing and Enamelling Imitation Stone, &c.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

16,301, S. Hill, Door-closing Springs and Checks.—20,207, R. Painter, Raising and Lowering Windows.—20,406, H. Lake, Apparatus for Cutting Veneer.—1,908, R. Wilford, Screw Fastening for Windows.—3,325, W. Summerson, Chimney Tops for Smoky Chimneys.—12,837, J. Costello, Sewer Traps.—14,427, K. McKenzie and G. Anderson, Chimney Tops.

SOME RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

OCTOBER 20.—By *Waterer & Sons:* "Ranelagh House," Chiswick, f., r. 150*l.*, 2,150*l.*; an enclosure of f. land, 3a. 0r. 36p., adjoining, 1,650*l.*—By *Chesterton & Sons:* 16, Upper Phillimore Gardens, Campden Hill, u.t. 54 yrs., g.r. 35*l.*, 2,750*l.*; 43, Thorngate-rd., Paddington, u.t. 72 yrs., g.r. 7*l.*, 400*l.*—By *H. Hooper:* 45, Granville-rd., Walthamstow, f., 400*l.*

OCTOBER 21.—By *Debenham, Tewson, & Co.:* "Hadley Grove," Hadley Green, with grounds, f., 1,700*l.*; 30, The Grove, Hackney, copyhold, 55*l.*; A copyhold house and shop, Lower Clapton-rd., r. 38*l.*, 75*l.*; f. marsh land, Tottenham, 2a. 1r. 38p., 100*l.*—By *G. Robins:* 85, 87, and 89, Pembroke-st., Islington, u.t. 59 yrs., g.r. 3*l.*, r. 148*l.*, 1,035*l.*; 115, Bemerton-st., u.t. 54 yrs., g.r. 6*l.*, r. 53*l.*, 260*l.*—By *Collett & Collett:* 50, Goldney-rd., Paddington, u.t. 73 yrs., g.r. 8*l.*, 400*l.*—By *D. Watney & Sons* (at Chester): "Tref-y-nant House," Ruabon, N. Wales, and 15a. 1r. 0p. f., r. 62*l.*, 1,560*l.*; Four f. cottages and 4a. 2r. 10p., f., r. 23*l.*, 1s. 4d., 260*l.*; f. grass land and spoil banks, 2a. 0r. 13p., 62*l.*; "Abernant House," f., r. 20*l.*, 400*l.*; Nant Farm and Wern Wood Farms, 72a. 0r. 30p., r. 59*l.* 12s. 8d., 1,620*l.*; "Acre House," and 41a. 2r. 39p., f., r., 120*l.* 2s. 8d., 1,500*l.*; f. warehouse and seventeen cottages, area 3a. 1r. 37p., r. 77*l.* 2s. 8d., 900*l.*; "The Black Lion" beer-house and two cottages, f., 560*l.*; "The Duke of Wellington" beer-house, r. 32*l.*, 940*l.*; Plâs-Bennion Farm (part of), 48a. 1r. 8p., f., 1,350*l.*; two f. cottages and 6a. 3r. 30p., 270*l.*; thirty-one f. cottages and 9a. 2r. 30p., 1,775*l.*; eight cottages in Hughes-row, u.t. 30 yrs., g.r. 2*l.* 5s. 6d., 125*l.*; enclosures of f. land, 5a. 2r. 23p., 210*l.*; an enclosure of f. accommodation land, 7a. 0r. 19p., 175*l.*; three plots of f. building land, 195*l.*; thirty-two f. cottages, r. 176*l.* 14s. 3d., 3,060*l.*

OCTOBER 22.—By *Baxter, Payne, & Lepper:* The f. residence "Dovedale," Bromley, 1,800*l.*—By *H. Griffin:* 34, Latchmere-rd., Battersea, u.t. 87 yrs., g.r. 2*l.* 10s., r. 20*l.* 16s., 130*l.*; 92a, Latchmere-grove, u.t. 91 yrs., no g.r., r. 14*l.* 6s., 55*l.*; 56, 58, and 60, Orbell-st., u.t. 87 yrs., g.r. 13*l.*, r. 93*l.* 16s., 875*l.*; 2a, Inworth-st., u.t. 87 yrs., g.r. 5*l.*, r. 32*l.* 10s., 220*l.*

OCTOBER 23.—By *H. Donaldson:* "The Duke of Edinburgh" public-house, Tottenham, f., 1,420*l.*; 45, Burmah-rd., Stoke Newington, u.t. 69 yrs., g.r. 6*l.* 7s. 6d., r. 40*l.*, 370*l.*; 1 to 4, Arundel-rd., Islington, f., r. 83*l.*, 865*l.*; 22 and 24, Mildmay-rd., u.t. 41 yrs., g.r. 3*l.*, r. 70*l.*, 690*l.*—By *Newbon & Harding:* 100, Blackstock-rd., Highbury, f., 850*l.*; 27 and 29, Sidney-st., Bethnal Green, f., r. 72*l.* 16s., 600*l.*; 18, Cricketfield-rd., Clapton, f., r. 35*l.*, 580*l.*; 31, Ringcroft-st., Holloway, u.t. 54 yrs., g.r. 6*l.*, r. 36*l.*, 320*l.*—By *Alder & Co.:* 1 to 11 (odd), Lisford-st., Peckham, u.t. 23 yrs., g.r. 14*l.* 4s., 245*l.*—By *H. J. Bliss & Sons:* 23 to 33 (odd), Mark-st., Stratford, u.t. 70 yrs., g.r. 25*l.* 4s., 880*l.*; 33, Osborne-rd., Forest Gate, u.t. 86 yrs., g.r. 8*l.* 8s., 355*l.*; 3 and 5, Norton-st., Bethnal Green, f., r. 44*l.* 4s., 465*l.*; 15, 17, and 19, Coventry-st., f., r. 93*l.* 12s., 1,000*l.*; 1 to 6, Murdock-cottages, Mile End, u.t. 53 yrs., g.r. 18*l.*, r. 155*l.*, 1,145*l.*—By *E. Wood:* 296, Hornsey-rd., Holloway, u.t. 61 yrs., g.r. 10*l.*, r. 38*l.*, 310*l.*; 66, Shenley-rd., Camberwell, u.t. 86 yrs., g.r., 6*l.* 6*l.*, 395*l.*; 1 and 3, Cook's-rd., Walworth, u.t. 18 yrs., g.r. 5*l.*, 205*l.*; 56, Wells-st., Camberwell, u.t. 65 yrs., g.r. 6*l.* 10s., 280*l.*; 30, 32, and 34, Roan-st., Greenwich, u.t. 7 yrs., g.r. 25*l.* 10s., 30*l.*; 80, Evershot-rd., Islington, u.t. 80 yrs., g.r. 6*l.* 10s., 210*l.* By *C. C. & T. Moore.*—1, Woodville-grove, Holloway, u.t. 72 yrs., g.r. 4*l.* 4s., r. 35*l.*, 215*l.*; 8, Baring-st., New North-rd., u.t. 42 yrs., g.r. 4*l.* 5s., 250*l.*; two plots of f. land, Bromley-by-Bow, 1,020*l.*; 6 to 12 (even), Parnham-st., Limehouse, u.t. 24 yrs., g.r. 8*l.*, 500*l.*; f.g.r. of 10*l.*, with reversion in 46 yrs., 250*l.*; 185, 187, and 189, Salmon's-lane f., 760*l.*; 157 and 159, Salmon's-lane, f., r. 43*l.* 10s., 580*l.*; 112 and 116, Salmon's-lane, f., r. 65*l.*, 1,250*l.*; 6 and 7, Little White Lion-st., St. Giles', f., 475*l.*

OCTOBER 24.—By *C. W. Millar:* 6, Hilldrop-rd., Camden-rd., u.t. 71 yrs, g.r. 9*l.*, 815*l.*; 54, Queen's-rd., St. John's Wood, and Studio, u.t. 20 yrs., g.r. 10*l.*, 260*l.*—By *Messrs. Willmott:* 22, Frithville Gardens, Uxbridge-rd., u.t. 85 yrs., g.r. 8*l.*, r. 33*l.*, 250*l.*; 74, St. John's Wood-ter., St. John's Wood, u.t. 44 yrs., g.r. 23*l.* 5s., 300*l.*; f.g.r. of 30*l.* with reversion in 62 yrs., Mardale-rd., Shepherd's Bush 750*l.*—By *Baker & Sons:* "Holwell Hyde Farm," Hatfield, Herts, 87a. 1r. 29p., f., r. 95*l.*, 3,000*l.*; An enclosure of f. building land, 16a. 2r. 10p., 800*l.*; f. land, 10a., Mundesley, Norfolk, 300*l.*

[*Contractions used in these lists.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; cres. for crescent; yd. for yard, &c.

PRICES CURRENT OF MATERIALS.

TIMBER.	£. s. d.	£. s. d.
Greenheart, B.G. ....ton	6 15 0	7 5 0
Teak, E.I. ....load	10 0 0	13 0 0
Sequoia, U.S. ....foot cube	0 2 8	0 3 0
Ash, Canada....load	2 10 0	4 5 0
Birch "	2 5 0	4 5 0
Elm "	3 10 0	4 15 0
Fir, Dantsic, &c.	2 0 0	3 15 0
Oak "	2 10 0	4 10 0
Canada	5 0 0	6 10 0
Pine, Canada red	2 10 0	3 10 0
" yellow	2 0 0	5 10 0
Lath, Dantsic....fathom	5 0 0	6 0 0
St. Petersburg	5 0 0	7 0 0
Deals, Finland, 2nd & 1st. std. 100	7 10 0	10 0 0
" " 4th and 3rd	7 0 0	7 5 0
Riga	6 0 0	8 10 0
St. Petersburg, 1st yellow	9 10 0	14 10 0
" 2nd "	7 10 0	9 0 0
" white	7 0 0	10 0 0
Swedish	7 0 0	15 0 0
White Sea	8 0 0	17 0 0
Canada, Pine, 1st	13 0 0	24 0 0
" " 2nd	9 0 0	16 0 0
" " 3rd, &c.	7 0 0	10 0 0

TIMBER *(continued)*.	£. s. d.	£. s. d.
Deals—Canada, Spruce, 1st	8 10 0	10 10 0
" " 3rd and 2nd ..	6 10 0	8 0 0
New Brunswick, &c.	5 10 0	7 10 0
Battens, all kinds	4 10 0	15 10 0
Flooring Boards, sq., 1 in., prepared, First	0 10 0	0 14 0
Second	0 8 0	0 10 6
Other qualities	0 5 6	0 7 9
Cedar, Cuba .... foot	0 0 3½	0 0 4½
Honduras, &c.	0 0 3½	0 0 4½
Mahogany, Cuba	0 0 4½	0 0 6½
St. Domingo, cargo average ..	0 0 4½	0 0 6½
Mexican "	0 0 4½	0 0 5½
Tobasco "	0 0 5½	0 0 6½
Honduras "	0 0 5½	0 0 6½
Box, Turkey .... ton	4 0 0	13 0 0
Rose, Rio	12 0 0	19 0 0
Bahia	11 0 0	18 0 0
Satin, St. Domingo....foot	0 0 9	0 1 3
" Porto Rico	0 0 10	0 1 6
Walnut, Italian	0 0 4	0 0 7

METALS.		
IRON—Bar, Welsh, in London tn	6 10 0	6 17 6
" " at works in Wales	6 0 0	6 10 0
" Staffordshire, in London..	7 0 0	8 0 0
COPPER—British, cake and ingot	63 0 0	64 0 0
Best selected	63 0 0	67 0 0
Sheets, strong	71 0 0	72 0 0
Chili, bars	58 10 0	0 0 0
YELLOW METAL.... lb.	0 0 6½	0 0 6¾
LEAD—Pig, Spanish .... ton	14 5 0	14 15 0
English, com. brands	14 10 0	14 15 0
Sheet, English, 3 lbs. per square foot and upwards....	16 10 0	0 0 0
Pipe	17 0 0	0 0 0
ZINC—English sheet .... ton	27 5 0	27 10 0
TIN—Straits	98 10 0	99 0 0
Australian	98 10 0	99 0 0
English Ingots	100 10 0	0 0 0

OILS.		
Linseed .... ton	22 12 6	23 2 6
Cocoanut, Cochin	34 0 0	0 0 0
" Ceylon	33 0 0	0 0 0
Palm, Lagos	29 0 0	0 0 0
Rapeseed, English pale	29 0 0	0 0 0
" brown	27 5 0	0 0 0
Cottonseed, refined	18 15 0	0 0 0
Tallow and Oleine	21 0 0	40 0 0
Lubricating, U.S.	5 0 0	6 0 0
" refined	7 10 0	12 0 0
TAR—Stockholm....barrel	1 1 6	0 0 0
Archangel	0 15 0	0 0 0

TENDERS.

[Communications for insertion under this heading must reach us *not later than 12 noon on Thursdays.*]

BALDERTON (near Newark).—For erecting almshouses (six dwellings). Messrs. J. W. Benwell and W. Taylor, architects, 25, Park-square, Leeds:—

Baines	£739	G. Brown & Son	£685
Crossland	699	Hand, Balderton (accepted)	660
Smith & Lunn	685	W. Brown	629

BARTON-UNDER-NEEDWOOD.—For sewerage works at Barton-under-Needwood and Newhall, near Burton-on-Trent, for the Burton-on-Trent Rural Sanitary Authority. Mr. Geo. Watson, surveyor, 38, Derby-road, Burton-on-Trent:—

	Barton-under-Needwood.	Newhall.
Maden	£306 10 0	£293 10 0
Lowe & Sons	185 0 0	185 0 0
S. Preston	178 4 0	....
J. Tomlinson	170 0 0	172 0 0
T. Perkins, Eggrington, Burton-on-Trent*	154 1 6	136 12 9

* Accepted for both contracts.

BRAITHWAITE.—For the construction of water-supply works at Braithwaite, Cockermouth. Mr. Thos. Weatherston, Surveyor, Cockermouth:—

J. Beattie	£432 12 6	J. T. Harrison	298 0 0
H. Fisher & Co.	364 18 0	J. Twinsame, Brigham*	280 10 2
Jno. Penttie	352 18 4	Jackson	260 6 9
Jno. Hunter	304 19 0		

* Accepted.

BRISTOL.—For alterations and additions to No. 35, High-street, Bristol. Mr. Henry Dare Bryan, architect, 24, College-green, Bristol:—

A. S. Scull	£750 10 0	T. R. Lewis	£709 0 0
J. Perrott	725 0 0	Wm. Church (accepted)	674 0 0

Shop-front.

W. H. Lewis £49 10 0

CARDIFF.—For alterations and additions to Police-station at Roath, Cardiff, for the Cardiff Corporation. Mr. W. Harpur, C.E., Borough Engineer, Town-hall, Cardiff:—

Hy. Davies	£1,177 15	Burton & Co.	£892 0
J. Gibson	970 15	John Robbins, Cardiff* ..	880 0
T. Gough	925 0		

* Accepted.

CARDIFF.—For additions and alterations to Canton Police-station, Cardiff, for the Cardiff Corporation. Mr. Wm. Harpur, M.Inst.C.E., Borough Engineer, Cardiff:—

W. Griffiths	£510	Hy. Davies, Cardiff (accepted)	£483

CATFORD.—For building one pair of villa residences at Catford, for Dr. Ch. Adams:—

Collins	£1,000 0 0	Francis & Flowiday, Lacun-rd., Dulwich*	£975 0 0
E. Janes	989 0 0		

* Accepted.

CHESTER-LE-STREET.—For further additions to jam factory, Chester-le-Street, county of Durham, for Mr. John W. Laurence. Messrs. Plummer & Burrell, architects, 46, Cloth Market, Newcastle-on-Tyne:—

William Norman, Chester-le-Street (accepted)	£183 18 3
Henry Mole, Chester-le-Street (accepted)	54 5 9

COWBRIDGE.—For the erection of a house and three cottages at Cowbridge, Glamorganshire, for Mr. W. W. Nell. Mr. Fred. J. Veall, architect, 6, Arcade-chambers, Cardiff. Quantities by the architect:—

Williams & Sons	£1,575 0 0	O. Purnell	£1,297 0 0
Henry Lewis	1,420 0 0	W. A. Janes	1,265 4 0
Elliot & Co.	1,364 0 0	Burton & Co., Cardiff (accepted)	1,195 0 0
John Haines	1,305 0 0		

DEVONPORT.—For alterations of premises situated at No. 4, Princes-street, Devonport, for the Plymouth Mutual Co-operative and Industrial Society, Limited. Mr. H. J. Snell, architect, Courtenay-street, Plymouth:—

Pain	£378	T. A. Fearn & Sons	£345
Perriton & Sheppard	350	W. Tremouth, Devonport* ..	405

* Accepted.

DONCASTER.—For draining, levelling, paving, and channelling roads on the Highfield Estate, Doncaster, for the Doncaster Union Rural Sanitary Authority. Messrs. Brundell, Simmons, & Brundell, Engineers, 1, Prince's-street, Doncaster:—

H. Barrows	£2,335 12 8	R. Jenkinson	£1,750 0 0
Geo. Ellis	2,120 0 0	H. Arnold & Son, Doncaster (accepted) ..	1,645 0 0
C. Sprakes & Son	2,100 0 0		

FOWEY.—For additions to the "Fowey Hotel," Fowey, Cornwall. Mr. Henry J. Snell, architect, Plymouth. Quantities by the architect:—

S. Trehane	£4,300 0	T. May	£3,893 0
T. G. Gill	4,195 0	Lapthorne & Goad	3,730 0
Toser & Son	3,980 0	Reed, Blight, & Co., Linn	3,674 0
J. Finch	3,980 0	J. P. Isbell, Fowey*	3,351 17
G. Shellabear	3,941 0		

* Accepted.

KELTY.—For additions to bakery and new stable, at Kelty, N.B., for the Kelty Co-operative Stores. Mr. John Houston, architect, Dunfermline, N.B.:—

Andrew Wilson	£282 0 0
R. Street & Sons, *Brickwork**	251 0 0
Andrew Addison	209 0 0
David Henderson, Lochgelly, *Joiners' Work**	205 0 0
John Paul	43 15 6
Wm. Stewart, Dunfermline, *Slaters' Work**	36 11 4
Wm. Binning, Lochgelly, *Plumber**	22 0 0
John Paul *Plasterer**	15 10 0

* Accepted.

KINGSBURY.—For the erection of stabling and coachman's rooms at "Oakfield," Kingsbury, for Mr. A. O. Crooke, the Hyde, Hendon. Mr. Henry Hall, architect, 10, Doughty-street:—

Tennant & Co.	£834 0 0	Camfield	£690 0 0
Donne	699 0 0	Allen	649 0 0

LEWISHAM.—For kerbing and tar-paving the footpaths and channelling and metalling the roadway of Algernon-road, Lewisham, for the Lewisham Board of Works. Mr. John Carline, Surveyor, Board of Works Offices, Catford, S.E.:—

Woodham & Fry, Greenwich (accepted)	£1,339

LLANELLY.—For the erection of the "Half-way" Hotel, near Llanelly. Messrs. J. Buckley Wilson and Glendinning Moxham, architects, Swansea and Llanelly:—

J. D. Williams	£2,153 0 0	G. Davies	£2,000 0 0
T. P. James	2,102 14 0	B. Howells & Sons	2,037 14 0
David Williams	2,090 10 0	G. Palmer	1,936 0 0
Thomas Watkins & Jenkins	2,078 0 9	Jenkins Bros.	1,936 0 0
Thomas & John Brown	2,076 19 9	G. H. Lloyd	1,679 9 0
		F. Strawbridge	1,650 12 2
		J. David, Llanelly*	1,646 0 0

* Accepted.

LONDON.—For the erection of Camberwell Public Baths, East Dulwich-road. Messrs. Spalding & Cross, architects, 15, Queen-street, E.C.:—

F. Stevens	£20,899	Flew & Co.	£15,470
S. & W. Pattinson	16,923	Gould & Brand	15,098
J. Lyerman	16,800	Allen & Sons	14,920
H. Knight	16,690	J. O. Richardson	14,858
J. T. Sargeant	16,278	S. J. Jerrard	14,543
J. T. Chappell	16,186	Balsam Bros.	14,349
Lunderdown & Co.	15,967	H. L. Holloway (accepted)	14,330
Higgs & Hill	15,940	F. J. Coxhead	14,290
F. J. Treweeke	15,750	Brass & Son (withdrawn)	13,278
B. E. Nightingale	15,650	Architects' estimate	14,225

LONDON.—For making up seven new roads or portions of roads, viz., Clifton-road (second section), Addington-road, Quernmore-road, Oakfield-road (second section), Fairfield-road, Miles-road (first section), and Wightman-road (fourth section), for the Hornsey Local Board. Mr. T. de Courcy Meade, Engineer and Surveyor:—

Holme & King	£10,849	T. G. Dunmore	£9,267
James Dickson	10,326	W. Griffiths	9,140
Jas. Bloomfield	10,311	B. Cooke & Co.	8,717
Thomas Adams	10,187	Sydney Hudson*	8,682
G. Bell	9,602	Jackson & Son*	3,333

* Part of work only.

LONDON.—For alterations and additions to the "Penton Arms," Pentonville-road, N., for Mr. W. Martin. Mr. John Cox Dear, architect, 117, Great Russell-street, Bloomsbury, W.C.:—

Patman & Co.	£1,377	Lascelles	£1,176
Anley	1,210	Drew & Cadman	1,149
Sharpe	1,189		

LONDON.—For new storm-water sewer, Ferme Park Estate, for the Hornsey Local Board. Mr. T. de Courcy Meade, Engineer and Surveyor:—

T. Adams	£2,098	B. Cooke & Co.	£1,724
Holme & King	2,017	T. G. Dunmore, Crouch End*	291
L. Bottoms	1,970		1,555
Geo. Bell	1,881	Jas. Dickson	1,553
J. Bloomfield	1,732		

* Accepted.

LONDON.—For new sewers from Hornsey to Highgate, for the Hornsey Local Board. Mr. T. de Courcy Meade, Engineer and Surveyor:—

T. Adams	£9,478	James Dickson	£8,240
L. Bottoms	8,887	J. Bloomfield	7,345
Holme & King	8,813	T. G. Dunmore	6,652
Geo. Bell	8,400	B. Cooke & Co., Battersea*	6,454

* Accepted.

LONDON.—For new storm-water sewer, Colney Hatch-lane, for the Hornsey Local Board. Mr. T. de Courcy Meade, Engineer and Surveyor:—

T. Adams	£336	B. Cooke & Co.	£285
L. Bottoms	304	J. Bloomfield	274
Holme & King	298	Jas. Dickson	261
G. Bell	285	T. G. Dunmore, Crouch End*	218

* Accepted.

LONDON.—For work at Harlesden College, for Mr. R. McKee Mr. Thos. F. Shaw, architect, Harlesden, N.W.:—

Pitman	£990	Tennant	£884
Cowley & Drake	940	Tout	839
Julian	930	Parfitt	839
Scharien	923	Jones	827
Neal	921	Simmons, Harlesden*	797
Godson	870		

* Accepted.

LONDON.—For alterations to the Temperance Hall, Swanscombe-street, Canning Town. Mr. A. Crow, architect, 35, Queen Victoria-street, E.C.:—

Harris & Wardrop	£417	Maddison	£305
Hosking	345	Chicken	284

LONDON.—For repairs at Hampton-avenue, Camberwell, for Mr. Augustus Jones. Mr. Thos. F. Shaw, architect, Harlesden:—

Jarvis	£350 0 0
Allen, Tottenham (accepted)	280 0 0

LONDON.—For alterations and additions at Greenhill-terrace, Harlesden:—

Parfitt	£140	Watts	£98
Foster	130		

LONDON.—For the erection of new shop and premises at Kensington Court, W., for Messrs. J. & F. Potter. Mr. A. Burnell Burnell, architect, 99, Chancery-lane, W.C. Mr. H. J. A. Chidgley, surveyor, 497, Commercial-road, E.:—

Duffield	£2,170	McCormack	£1,903
Aldin Bros.	2,080	Thos. Hussey	1,893
W. Nash	2,000	Henrne	1,880
eelle & Co.	1,974		

LONDON.—For marble mosaic paving of vestibule and hall at Mount-street Chambers, W. Mr. A. J. Bolton, architect:—

Mainser & Kempthorne (accepted)	£115 0

LONDON.—For the erection of a Citadel at South Tottenham, N., for General Booth. Quantities not supplied. Mr. W. Gilbee Scott, architect :—

Percival Hart	£2,100 0	A. Martin	£1,629 10
E. Jarvis	1,940 0	F. J. Coxhead	1,589 0
H. Knight & Son	1,806 0		

LONDON.—For alterations at the Grosvenor Gallery, Bond-street, W., for Sir Coutts Lindsay, Bart. Mr. J. Waldram, C.E., surveyor, 13, Buckingham-street, W.C. :—

Bywaters	£2,818	Johnson & Manners	£2,495
Patman & Fotheringham	2,736	Grover & Son	2,490
Styles & Son	2,684	Shoolbred & Co.	2,481
Lapworth Bros. & Harrison	2,598		

LONDON.—For the construction of sewers (section 2) at East Ham, E., for the Local Board. Mr. W. H. Savage, Surveyor to the Board, Local Board Offices, East Ham, E. :—

R. Cooke & Co.	£4,960	John Jackson, Broadway, Plaistow*	4,800
John Surrill	4,890		
Leonard Bottoms	4,875		

* Accepted.

LONDON.—For building two pairs of villa residences, Crouch-end. Mr. H. A. Rawlins, architect :—

Davis Bros.	£2,345	Scutt	£1,920
Smith Gervase	2,280	E. Houghton & Son	1,848
Vials	1,980	Piper	1,560

LONDON.—For redecorations, &c., at 44, Hyde-park-square, for Mr. A. Black. Mr. A. Lett, architect :—

W. D. Palmer, Herne-hill (accepted) £204 0 0

NEWCASTLE.—For building new Industrial Schools, Newcastle-on-Tyne, for the Committee. Messrs. Plummer & Burrell, architects, 46, Cloth Market, Newcastle-on-Tyne :—

Walter Barker	£1,098 0 3	Walter Scott	£1,049 1 5
John Ferguson	1,074 13 6	Middlemiss Bros.*	998 0 0

* Accepted.

PENMAENMAWR.—For building a Wesleyan chapel at Penmaenmawr, North Wales. Mr. John Wills, architect, Victoria-chambers, Derby :—

Evan Evans, Penmaenmawr, and John Williams, Bangor (accepted) £2,029 0 0

RYE.—For the erection of a police-station, at Rye, for the East Sussex County Council. Mr. Henry Card, County Surveyor, Lewes :—

A. Compert	£1,178 19 0	G. E. Chapman	£1,051 0 0
J. G. Nicolls	1,126 0 0	Taylor Brothers	1,049 0 0
J. Finch	1,126 0 0	H. Knock, Ashford*	900 0 0

* Accepted.

STAFFORD.—For the erection of new offices, Eastgate-street, Stafford, for Messrs. J. F. & H. S. Humby. Mr. Geo. Wormal, architect, Stafford :—

Adams & Pemberton	£457	J. Jervis	£395
A. F. Whittome	449	W. T. Woollams, Gaol-road, Stafford*	390
Chatfield & Wrench	427		
F. Espley	427		

*Accepted.

SOUTH MIMMS (near Barnet).—For erecting house and stables at South Mimms. Mr. Arthur S. Pridmore, architect and surveyor, 140, Junction-road, London, N. :—

C. W. Burge	£2,190	John Curnow	£1,898
J. W. Falkner	2,083	Jared Gear	1,883
Wm. Longmire & Co.	2,040	J. W. N. Miller	1,880
Fredk. Voller	1,963	C. Allen & Son	1,775
S. & W. Pattinson	1,948	C. Miskin, St. Albans*	1,694

* Accepted.

STREATHAM.—For the erection of new school, Pinfold-road, Streatham, for Dr. J. L. Stanley. Mr. E. B. l'Anson, architect :—

W. D. Palmer, Herne-hill (accepted) £810 0 0

TUAM.—For the construction of a concrete reservoir and pumping-station, and for laying about six miles of water mains and other works, at Tuam, co. Galway, for the Tuam Union Guardians. Mr. Chris. Mulvaney, M.Inst.C.E., Engineer, Castlerea, Ireland :—

Sharp & Cruickshank	£2,999 0 0	T. Dixon, 7, Angle-street, Dublin*	£2,165 19 3
J. Cunningham	2,415 0 0		
J. Henry	2,210 2 8	Robt. Simpson†	2,108 17 0

* Accepted. † Informal.

Re Portland Arms, High-street, St. John's Wood.—In our last issue (page 336) we gave the name of S. E. Todd as accepted for the above; it should have been *G.* E. Todd.

Alterations to the "Rum Puncheon" Public-house.—We are asked to state that the amount of the tender for the above work, which appeared in our issue of the 11th ult., should have been 429*l.*, not 400*l.* The mistake was not ours.

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TO CORRESPONDENTS.

A. W. & Co.—W. G. F.—S. C. (thanks, but hardly suitable. Please send address).—R. J. L. (shall have attention).—P. E. P.

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